

\$6.00

A PAPERBYTE^{T.M.} BOOK

JACK EMMERICHS

SUPER- WUMPUS



JACK EMMERICH'S

SUPER - WUMPUS

BYTE Publications, Inc.
70 Main Street
Peterborough, New Hampshire 03458

Copyright © 1978 BYTE Publications Inc. All Rights Reserved. BYTE and PAPERBYTE are Trademarks of BYTE Publications Inc. No part of this book may be translated or reproduced in any form without the prior written consent of BYTE Publications Inc.

The SUPERWUMPUS program is Copyright © 1978 by Jack Emmerichs of Advanced Technology Associates, and is reproduced with the author's permission under exclusive book publishing license.

Library of Congress Cataloging in Publication Data

Emmerichs, Jack.
Superwumpus.

(A PAPERBYTE book)

1. Games—Computer programs. 2. Basic (Computer program language)
3. Games—Data processing. 4. Assembler language (Computer program
language) 5. Motorola 6800 (Computer—Programming. I. Title.
GV1469.2.E46 793'.028'54 78-7537
ISBN 0-931718-0301

Printed in the United States of America

Table of Contents

The Origin	5
The Game	5
Fundamentals	5
Extensions	6
Supplies	6
Random Events	6
One Last Chance	7
Rules	7
 Program Notes	 8
The 6800 Assembler Program.	8
The BASIC Program	11
 Appendices	 13
A. Sample Run of BASIC SUPERWUMPUS	15
B. Source Listings	23
6800 Assembler Source Listing	25
BASIC Source Listing	51
C. Bar Codes.	59
6800 Assembler Bar Code	61
BASIC Bar Code	69

The Origin

The game of SUPERWUMPUS is based on the game of WUMPUS, as described in the book *What To Do After You Hit Return* by the People's Computer Company. Since the source listing for WUMPUS was not printed in the original PCC book, SUPERWUMPUS has been written from scratch, in both 6800 assembler code and BASIC. The primary differences between the two versions are program size and machine dependency. The 6800 assembler program will run in 4 K of user programmable memory with room to spare, but cannot be directly used with any other type of processor. With varying degrees of program modification, the BASIC program can be made to run on virtually any machine supported by a BASIC interpreter, and will require about 9,950 bytes of work space in addition to the memory required by the interpreter.

Although both listings can be used as they are, the 6800 assembler program listing warrants further explanation. The assembler that created this listing is the same program that was used to write "6800 Tiny Assembler (available as a

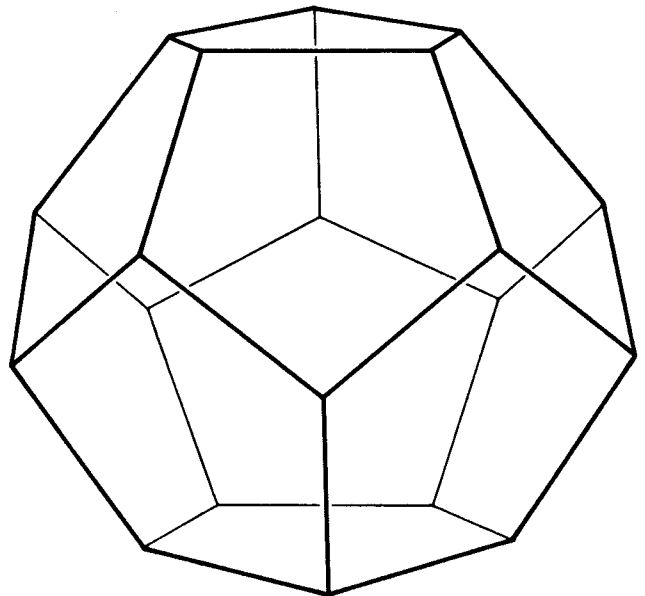
PAPERBYTE™ book, *Tiny Assembler 6800 Version 3.1*, or see the April and May 1977 issues of BYTE magazine). "Tiny Assembler 6800" is a one pass rather than the normal two pass assembler, and the listing differs significantly. The generated code for the operand of a forward reference is a dummy value of zero. This is *not* executable code even though it is printed on the source listing. The actual executable code is developed when the forward reference is resolved by using the referenced symbol as a label. The actual operand is then printed on the listing directly under the statement containing that label. Note that when this happens, the address given for this code will cause it to overlay the earlier dummy code (this may take a bit of getting used to at first, so be sure you know how it works before you attempt to make any modifications based on this listing). Notes on special notation and other items of interest to anyone translating the BASIC listing will be found on page 11 in the section called "The BASIC Program."

The Game

Fundamentals

The game begins with the player (hunter) somewhere deep within the Wumpus's cave, which consists of 20 rooms connected by tunnels. The rooms form the vertices of a dodecahedron and the tunnels form its edges. Therefore, each room has three tunnels connecting it to other rooms. The player starts in one of these rooms while the Wumpus is asleep in another. The hunter begins with five arrows or darts with which to shoot the Wumpus. Each arrow may be used only once. In the 6800 assembler version of the game, the object is to kill the Wumpus before he (she? it?) can find and eat the hunter. After watching several people become the blood-thirsty killers of an animal that they knew nothing about, and being of much more humane sentiments, I decided to change the object of the BASIC version of the game to that of immobilizing the beast so that it can be tagged with a beeper. When the beast wakes up, it will lead the hunter out of the caves and that is the *only* way the exit can be found. The play of the game is the same for both SUPERWUMPUS versions but there is less violence in the BASIC version.

To complicate things a bit, there are bottomless pits in some of the rooms. If you move into one of these,



you fall out of sight, and emit a pitiful scream. This causes the premature termination of the game. There are also rooms full of bats in the cave in which the bats pick you up, fly you around for awhile, and then drop you randomly into a new room. Note: bats can drop you into a pit, into another room of bats, or on top of the Wumpus! In the original WUMPUS there were a fixed number of bat caves and pits, but in SUPERWUMPUS the number as well as the location of these hazards changes for each new game.

For each turn, the player is told the number of the room the hunter is currently in, the numbers of the rooms connected to it by tunnels, and the presence of any hazards (pits, bats or the Wumpus) that are exactly one room away. Alas, the player is not told which room such a hazard is in.

During each turn the hunter may move into an adjoining room or shoot through several connecting rooms. The hunter must move carefully through the caves avoiding hazards until the sleeping Wumpus is found – and then shoot him. While trying to navigate the caves, it is a good idea to make a map showing the locations of everything found so far. If the search for the Wumpus is a long one, alternate routes and shortcuts begin to appear, and hazards can often be pinned down to specific rooms. If the hunter makes a shot but does not hit the Wumpus, the Wumpus will wake up and become a much harder to find moving target. The Wumpus may also be awakened if a clumsy hunter stumbles into his room and steps on him. (Getting out of this situation is dangerous, but it can be done.) If the awakened Wumpus comes into your room, or if you blunder into his, he will eat you up; end of game.

To add a margin of safety to the game, the hunter may back up and shoot through from one to five rooms, as long as they are connected. If they are not connected, the shot goes wild and may hit just about anything, including the hunter! In the 6800 assembler version of the game, the number of rooms that may be shot through has been reduced from five to three to eliminate some tricky strategies that could make the game trivial. In the BASIC version this has been accomplished by not allowing the hunter to shoot through the same room more than once per turn.

Extensions

The preceding was about all that was printed about the game of WUMPUS in the first edition of *What To Do After You Hit Return*, and is certainly enough to spark one's interest. Since SUPERWUMPUS was to be written from scratch, it seemed like an ideal opportunity to incorporate more and better *goodies*. In searching for such goodies, several people spent an amazing amount of time tossing around some truly strange ideas, many of which were based on aspects of other well known computer games that had proven to be quite enjoyable.

Supplies

The first change in the game provides a finite amount of some necessary resource which can be diminished as time is used up. Without such a restriction, a careful player could often poke about the caves for as long as it takes to locate the Wumpus and all hazards. Among the several time limits considered to prevent such slow games: available

oxygen in the caves, diminishing flashlight batteries, food, water, and an arbitrary number of hours or days. It was finally decided that a quantity of nonspecific "supplies" should be used because fewer problems would be encountered in trying to integrate the new components into the game's structure. This general resource also allows the game to increment or decrement the available supplies randomly throughout the game. If the supplies run out before the Wumpus has been caught, the hunter starves to death and loses. The amount of supplies used in both the 6800 assembler and BASIC versions of the game has been set after many experiments, but like most values in the game, can be changed by the user if desired.

Random Events

The second major change in the game was to introduce a series of random events beyond the player's control that can change the course of the game. Random events are fairly common in computer games and usually provide the game with a personality all its own. In SUPERWUMPUS several variables can be randomly changed by the user: the amount of supplies available, the configuration of the caves, the player's location, the location of the Wumpus and hazards, the number of shots left, and on and on. It is important, however, to keep the game from getting out of control or from becoming either too simple or too difficult. For example, a random good event should be balanced against a bad one.

The first event that has been introduced is to allow rats to come up from the pits and devour half of the hunter's available supplies. Having a limited quantity of supplies is in itself a restriction, and losing half of them could be devastating. To compensate for this, the second event has been added: the hunter now finds supplies left over from a previous (eaten?) hunter. To keep these events from cancelling one another, the supplies found are always a small, random amount. This is a minor compensation for losing half of your existing supplies, so the probability of finding supplies is higher than that of the rats devouring them. The final effect is that rats attacking at the beginning of the game (when there are more supplies to lose) can be disastrous; rats attacking at the end of the game are not so bad; and finding supplies is a minor boon *whenever* it happens. (An increase in supplies may happen frequently and can often save the hunter near the end of a tight game.)

Another random event outdates the player's map. A rockslide from deep within the caves can close a tunnel. Tunnels closed in that manner are never reopened during a game, and the player is only informed that a rockslide happened, not where it occurred. This simulates the echoing reverberation of a real rockslide, were one in a real cave. No player, Wumpus, or arrow may go through a closed tunnel, but bats (who know secret passageways between rooms) are not affected by such closures. Rockslides are fairly uncommon and are only a minor nuisance. (You might want to experiment with a shaky cave having a high propensity for slides to see how it changes the game.)

The last random event can have a major effect on the game. A colony of bats may migrate from one room to another. Again the player is informed that the event has

occurred, but not where. For example, if a map has two bat colonies marked on it when a migration occurs, one of these notations may become incorrect. At the same time, rooms previously known to be safe may become the new home of the migrating colony. An additional inconvenience is that, when the bats move, the hunter is forced to hide and use up some supplies waiting for things to quiet down. To confuse things further, the bats may move right into the hunter's room. If they do, the hunter will be relocated as if the hunter had stumbled into a bat colony's cave. To add injury to insult, the hunter cannot hang on to all of his supplies while hanging from a bat, so some supplies are lost each time the bats relocate the hunter. All of this can get somewhat discouraging if you are finally dropped into another colony of bats, and so on.

Several other random events were considered but not implemented because they took up too much room in code, made the game too easy, hard, or different, or because they simply did not 'feel' right. Unused random events included:

- Finding arrows which could be reused.
- Moving the Wumpus more than one room at a time.
- Creating new pits or bat colonies.
- Finding footprints revealing where the Wumpus has been.
- Having the hunter break a leg or sustain some other physical injury which would slow down movement within the cave.

One Last Chance

The third major change to the original game was developed to benefit the hunter who has used up all five arrows or darts. As the game was originally set up, a player could only wait until the Wumpus found the hunter, or until his supplies had run out and the game was lost. This seemed unsatisfying, and a way was sought which would give the hunter one last chance of winning, however small.

Several approaches were considered: hand to hand combat with a small chance of winning; hand to hand combat with the last arrow as a hand weapon providing better odds for the hunter; a small chance of being able to wear the Wumpus down psychologically in an argument (not considered for long); hiding a knife in the cave, letting the hunter search for it, and going back to hand to hand combat; and many more. The final choice gives the hunter an opportunity to find some loose rocks after the last arrow is spent, and then hurl them at the Wumpus at close range, in hopes of knocking him out.

To implement this, finding a rock to throw has been added as another random event that happens after all the arrows are gone. A rock can be thrown into only one room (using the shoot command). If that room contains the Wumpus, the rock may or may not hit him, and if it does hit him it may or may not knock him out. The chances of having all of this work out are so slim that I have never seen a game won by throwing rocks, but it *is* possible. (Usually the supplies will have been exhausted before the hunter can get into a room next to the Wumpus, who is moving about by then, and throw a rock.)

Rules

Several aspects of the game have been left undefined in the WUMPUS writeup mentioned above. Generally, the approach taken in SUPERWUMPUS has been to choose rules that introduce random action where possible, without making the program unduly complex. Standard message formats have been designed to limit the amount of additional information that can be deduced from them. The rules that have been selected are as follows:

- You may shoot through a bat cave, but you may hit a bat. You will be told if you hit a bat, but not the number of the room that the bats are in.
- You may shoot over a pit, but you may lose your arrow. Again, you are told that you lost your arrow, but not the number of the room in which it was lost.
- A room may not contain more than one hazard (bats, pits or the Wumpus).
- You may be dropped *anywhere* by the bats.
- The awakened Wumpus may or may not move during each turn.
- When the Wumpus moves, it is always to an empty room that is connected to his current room. If he is surrounded by hazards and closed tunnels, he is boxed in and unable to move.
- If you shoot yourself (some hunter!), you may or may not die from the shot. Injuries are severe, however, and require consumption of some of the hunter's limited supplies.
- Between games, all room numbers are scrambled, so an old map is no good in a new game. Furthermore, there is no correlation between the order in which connecting rooms are printed for each turn, and the listing order of warning messages for nearby hazards.

Program Notes

The programs have been developed in a structured manner with separate functions controlled by independent subroutines. For the BASIC version of the program, many of the service subroutines from the original 6800 assembler listing were available as standard BASIC functions, so the structure became simpler. The structural networks for the 6800 version are shown in figure 1 and figure 2. The network diagram for the BASIC program is shown in figure 3.

The 6800 Assembler Program

At the heart of the program are several tables that reside in page zero. The first table (ROOMS) is a map of the cave with an entry for each of the twenty rooms. Each entry contains three bytes which show the three rooms which are connected to the current entry by tunnels, and one byte showing the content of the current entry. Valid room contents are: P=pits, B=bats, W=Wumpus, and a null byte indicating an empty room. This map may be printed at the end

of each game to let the player find where there might be errors on his or her map. As the game progresses, the value of room contents will change, but the map of room connections will remain essentially the same. The order in which connections are listed for a given room are periodically rotated. This prevents the listings of hazards and connected rooms from indicating which rooms contain which hazards. Rockslides can also change the values of connecting room entries to indicate closed tunnels.

All room numbers in the ROOMS table remain the same for each game. Therefore, the second table TRANS is used to create the illusion of cave room numbers changing between games. This table translates between internal room numbers used by the program and external room numbers used by the player. Since this table is reloaded randomly between games, a new user's map must be made for each game. The translation can be suppressed by changing the byte at hexadecimal location 0ABD to a return from subroutine (code hexadecimal 39). If this is done before any

FIGURE 1: The structure of the 6800 version of SUPERWUMPUS has been split between the primary game functions and the common utility functions. The primary functions shown in this figure are as follows:

MAINLINE	— Program mainline
GENCAVES	— Generate a cave configuration
CLEAR	— Clear the caves of the previous game
GENITEM	— Randomly generate a hazard within the caves
PLAY	— Mainline for a single game
DISPLAY	— Display a map of the caves
PROMPTIN	— Accept a reply from the keyboard
HAPPENINGS	— Generate random events
ROCKX	— Find a throwing rock
RATS	— Rats eat half of the available supplies
SLIDE	— Create a rockslide
EXTRA	— Find extra supplies
MIGRATION	— Move bats from one room to another
MOVE	— Move the hunter
SHOOT	— Shoot an arrow or throw a rock
STBAT	— Shoot a bat
STSELF	— The hunter shoots him- or herself
STPIT	— Shoot a pit
THROW	— Throw a rock
ROOMIN	— Accept a room number from the keyboard
CONNECTED	— Check to see if two rooms are connected
REPORT	— Produce the report for each turn
BATS	— Report relocation by bats
BUMP_W	— Report bumping into the Wumpus and what happens
PITS	— Report falling into a pit
RPTROOM	— Report surrounding room hazards
DAYSLEFT	— Report how many days are left
ROOMOUT	— Calculate a room number to display
DECOUT	— Display room numbers or days left in decimal
MOVE_W	— Move the Wumpus

The numbers in parentheses are the hexadecimal addresses of the routines.

games are played, the translation table will be revealed to the user and internal room numbers will be used in each game. All references to a room number, including the map which can be listed at the end of each game, use the translation table. The map is printed in the same order as the ROOMS table, which is why it appears to be listed in a random order. (This inconvenience has been eliminated in the BASIC version of the game.)

To close a tunnel during a rockslide, the room connection values in the ROOMS table are complemented to indicate that a tunnel is closed. This value must then be recognized throughout the program as a closed connection. Furthermore, the connection from room "B" to room "A" must be closed as well as the connection from room "A" to room "B", requiring changes to both the "A" and "B" room table entries. At the start of each game, each room connection is checked for an abnormally high value and if necessary, is complemented back to a valid room number. Blocked tunnels do not show up during normal play or during a listing of the map at the end of the game.

The PROBABILITY subroutine uses the value of the byte pointed to by the index register as a per cent chance of success. For example, if the index points to a value of 33 then 33% of the time PROBABILITY will return a one

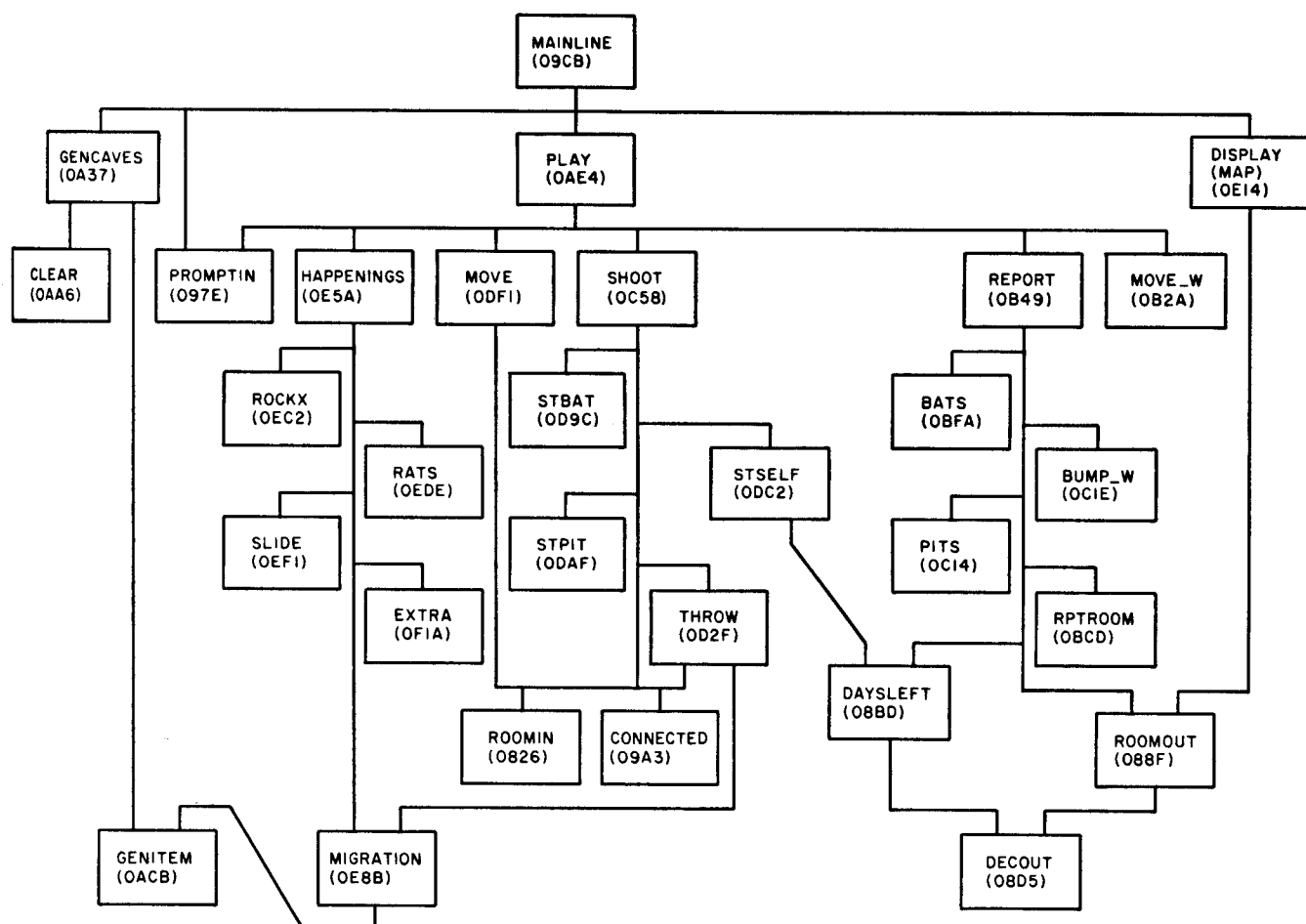
in the A accumulator and 67% of the time it will return a zero. The actual percentage will depend on how good the random number generator is. The index register is incremented by each call to PROBABILITY, so a series of calls to this routine will return a series of answers based on the probability values stored in successive bytes of memory. The table of probabilities can be found after the TRANS table.

The external linkage table is located after the PROBABILITY table and refers to the following IO functions:

- CHARIN: Input a character into the A accumulator.
- CHAROUT: Output a character from the A accumulator.
- STROUT: Print characters from the position currently pointed to by the index register until a code hexadecimal 04 is found.
- BLKOUT: Print a blank character.

The structure of the table permits the A accumulator to remain unchanged for all but the input routine. All of these functions are currently accomplished by calls to the Motorola MIKBUG monitor.

The random number generator is from the Motorola



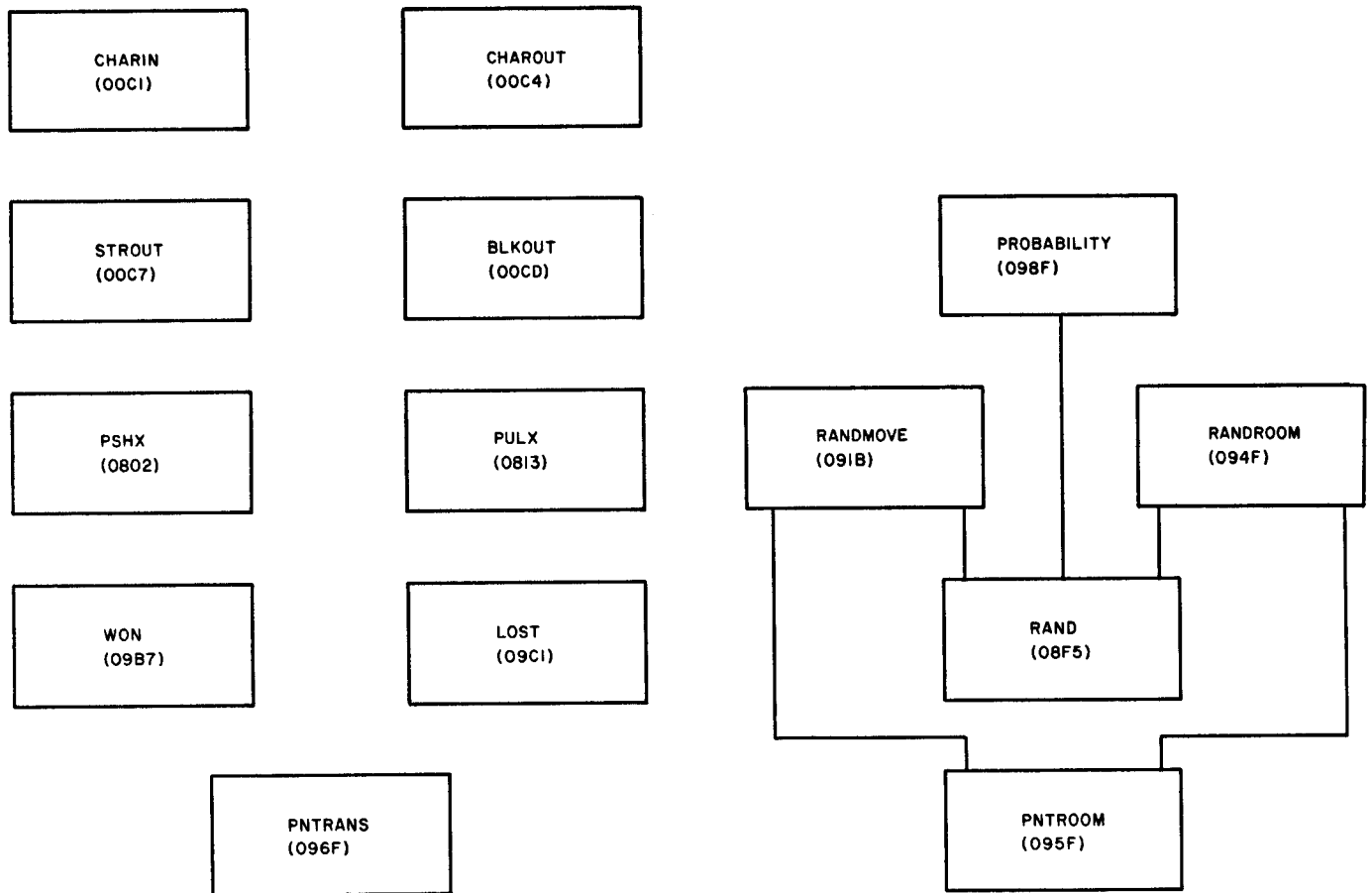


FIGURE 2: Common utility functions for the 6800 version of SUPERWUMPUS are broken into monitor functions which are not included in the listing but are accessed by the external jump table, and program functions which are included in the listing. (The numbers in parentheses are the hexadecimal addresses of the routines.) The monitor functions are initially set to use MIKBUG routines and include:

CHARIN	— Fetch a character from the keyboard
CHAROUT	— Display a character
STROUT	— Display characters from the address in the Index Register until a hexadecimal 04 value is found.
BLKOUT	— Display a blank character

The program utility functions are as follows:

PSHX	— Push the Index onto the stack
PULX	— Pull the Index off of the stack
WON	— The game has been won
LOST	— The game has been lost
RAND	} — See explanations in the text
PNTRANS	
PNTRROOM	
PROBABILITY	
RANDMOVE	— Make a random move from a given room
RANDROOM	— Select a random room

NOTE: The random number work space is not initialized in this program. In its original form, the program was loaded in two sections leaving the workspace with whatever happened to be there. If this cannot be done, an initialization routine will have to be written to create the initial random seed and prevent the same game from being played over and over.

library. If you wish to use the random number generator copyrighted by Technical Systems Consultants (TSC), it will fit with room to spare. (Extra locations and a four byte random save area are reserved after the existing random number generator.)

The subroutines PSHX and PULX are pseudo machine operations. A call to PSHX is the same as pushing the index onto a stack. A call to PULX pulls the index value off of a stack. The return address for these subroutine calls is automatically handled, so they may be used in the same way that machine instructions for PSHX and PULX would be used. These are very handy subroutines.

The subroutine PNTROOM sets the index to the entry in the ROOMS table which points to the room indicated by the A accumulator. Similarly, PNTRANS sets the index to the entry in the TRANS table which points to the room indicated by the A accumulator.

The BASIC Program

The version of BASIC used for this SUPERWUMPUS program is the 10 K version that comes with the North Star

mini floppy disk system. Several points of notation are worth mentioning to anyone planning to implement SUPERWUMPUS in some other version of BASIC.

The backward slash (\) is used to separate multiple statements per line. For example:

PRINT\PRINT\PRINT

would print three blank lines. (Some other BASIC interpreters use a colon (:) for this purpose.)

Input statements with imbedded literal strings can be changed to the combination of a PRINT statement followed by an INPUT statement. The PRINT statement itself does not use the semicolon (;), so the delimiters in a print list are all commas which do not indicate zone printing. The special formatting features of the PRINT statement have been used in lines 3350 and 3410 (see Appendix B for the BASIC program listing) to format a printed table. Zone printing of these numbers could be used to accomplish the same thing in another version of BASIC.

The functions at the end of the listing make use of the multi-line function feature of this version of BASIC. All

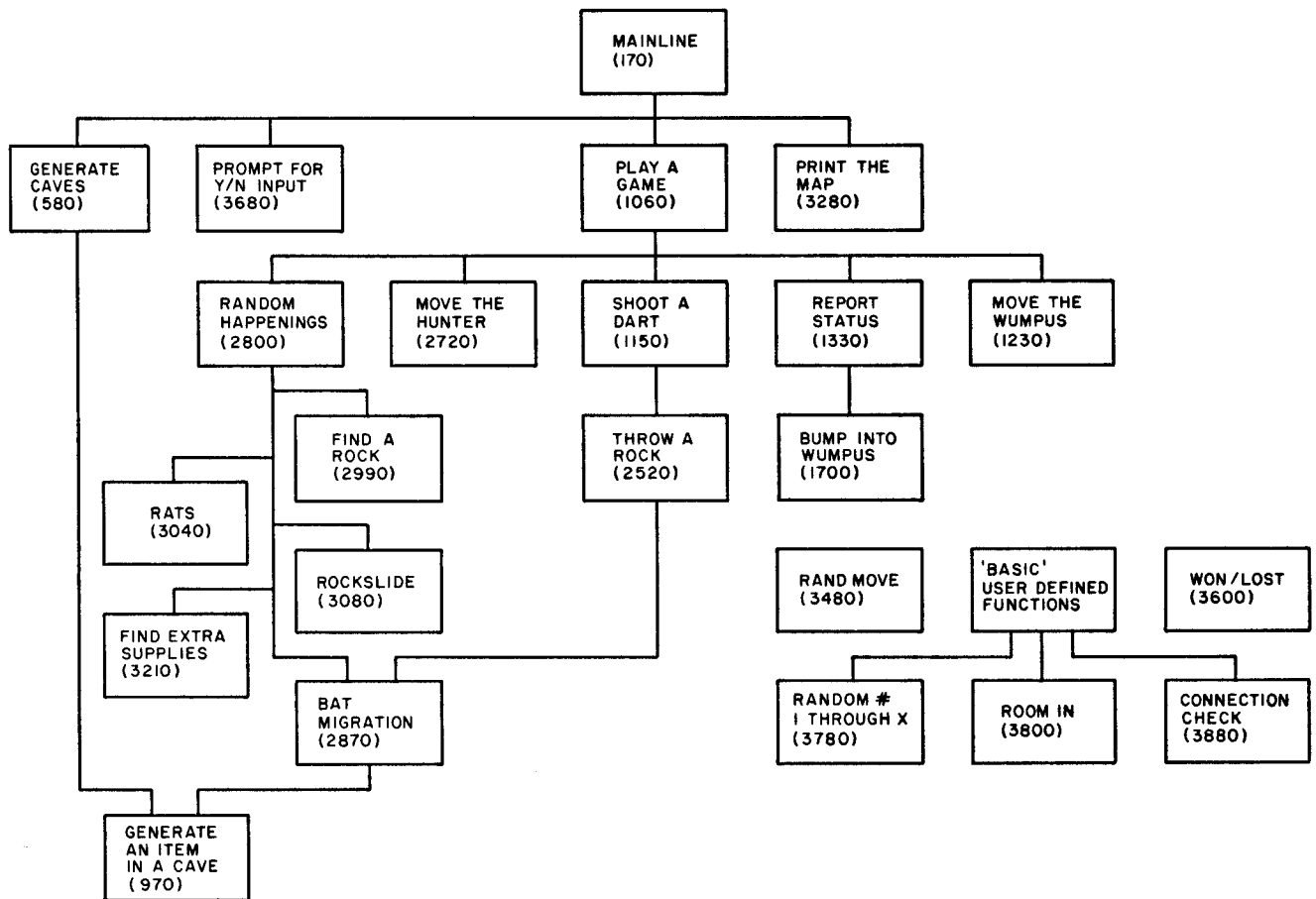


FIGURE 3: The structure for the BASIC version of SUPERWUMPUS is quite a bit simpler than for the 6800 version. This is primarily due to the greater capabilities of the higher level language. The functions that are required are essentially the same as those in the previous figures. The numbers in parentheses represent line numbers in the BASIC program where that particular code can be found.

three functions can be rewritten as subroutines if need be. In some versions of BASIC, such functions must be at the beginning of the listing before they are first used. If this is the case, they can be easily moved.

Without the REMARK lines, this listing uses 8,822 bytes of memory and requires about another 1,118 bytes for data storage, giving a final requirement for 9,940 bytes of available memory. With the remarks added, this grows to about 10,160 bytes of memory. All of the remarks were added after the program was operational, so they can be removed if space is a problem.

The RESTORE statement at line 1800 restores the data stack to a specific source code line number. If this is not available in a particular version of BASIC, this section of code (which slows down the printed output) will have to be rewritten. The EXIT statement is a GOTO that leaves a FOR/NEXT loop.

The operation of the BASIC program is essentially the same as the 6800 program. The ROOMS table has been implemented as a combination of array R(20,3) which contains the room interconnection map, and the array C\$(20) which contains the room contents. The translation table TRANS has been implemented as array T(20,2). Tunnels are closed by setting connecting room number entries to zero rather than complementing them, and the entire room connection array R is reloaded between each game to restore the correct values. Rather than storing the game's various probability values in a table, they have been incorporated into the equations which use them. Therefore, to change any probability constants, you will have to find the portion of the program that uses that particular con-

stant and change it there. Each probability constant is used only once.

Table 1 lists the major BASIC variables that have not already been mentioned, along with their associated meanings.

SUPERWUMPUS has been a fun project for me, and I hope it provides you with many hours of enjoyment. Perhaps some of you will come up with further extensions of the game. If so, I wish you good luck, but I must warn you to be careful. The Wumpus can be habit forming.

A	=	Awake switch
A1(5)	=	Room array for shots
A\$	=	General work string
C	=	Current room for hunter
D	=	Days left (later changed to hours)
E	=	End of game flag
R	=	Rock count (different from R(20,3))
R0	=	Temporary room number
R1	=	Temporary room number in rockslides
R2	=	Room counter for shots
R3	=	Test room for shots
S	=	Shots left
S0	=	Stop the arrow flag
W	=	Wumpus's room
W1	=	Wild shot flag
W2	=	Flag to indicate random move is by Wumpus
X\$	=	Symbol to load in GENITEM
I	=	General counter
J	=	General counter

Table 1: Major BASIC variables not mentioned in the text and their associated meanings.

Appendices

Appendix A:

Sample Run of BASIC SUPERWUMPUS

TO START THINGS OFF, ENTER A RANDOM NUMBER: 123

WELCOME TO THE WUMPUS CAVES.
DO YOU WANT PLAYING INSTRUCTIONS? PERHAPS
PLEASE ANSWER YES OR NO
DO YOU WANT PLAYING INSTRUCTIONS? NO

HANG ON A BIT WHILE I SET THIS UP

---START OF NEXT HOUR---

<<< I HEAR WINGS >>>

CURRENT ROOM IS 6
TUNNELS LEAD TO 10 17 1
YOU HAVE ENOUGH SUPPLIES FOR 10 MORE HOURS

SHOOT OR MOVE? MOVE

WHERE TO? 17

WHOOPS, BATS RELOCATE YOU.
YOU LOSE SOME SUPPLIES.
WHOOPS, BATS RELOCATE YOU.
YOU LOSE SOME SUPPLIES.

---START OF NEXT HOUR---

<<< I FEEL A DRAFT >>>

CURRENT ROOM IS 18
TUNNELS LEAD TO 3 19 15
YOU HAVE ENOUGH SUPPLIES FOR 6 MORE HOURS

SHOOT OR MOVE? M

WHERE TO? 3

LISTEN!! A ROCK SLIDE HAS CLOSED A TUNNEL

---START OF NEXT HOUR---

CURRENT ROOM IS 3
TUNNELS LEAD TO 2 4 18

YOU HAVE ENOUGH SUPPLIES FOR 5 MORE HOURS
SHOOT OR MOVE? M
WHERE TO? 4

---START OF NEXT HOUR---

<<< I HEAR WINGS >>>

CURRENT ROOM IS 4
TUNNELS LEAD TO 16 8 3
YOU HAVE ENOUGH SUPPLIES FOR 4 MORE HOURS
SHOOT OR MOVE? M
WHERE TO? 16

---START OF NEXT HOUR---

<<< I HEAR WINGS >>>
<<< I SMELL A WUMPUS!!! >>>

CURRENT ROOM IS 16
TUNNELS LEAD TO 4 12 13
YOU HAVE ENOUGH SUPPLIES FOR 3 MORE HOURS
SHOOT OR MOVE? SHOOT
HOW MANY ROOMS DO YOU WISH TO SHOOT THROUGH? 1
ENTER THE FIRST ROOM NUMBER: 12

WATCH IT, THE WUMPUS IS AWAKE!
GOOD FOR YOU, YOU GOT HIM AND HE
WILL LEAD YOU OUT OF THE CAVE
WOULD YOU LIKE TO SEE A MAP OF THE CAVES? YES

ROOM	TUNNELS			ITEM	ROOM	TUNNELS			ITEM
1	7	12	6		11	12	8	10	
2	3	13	9		12	16	1	11	W
3	2	4	18		13	2	16	7	B
4	16	8	3		14	19	10	20	
5	9	7	17		15	18	9	0	P
6	10	17	1		16	4	12	13	
7	13	5	1		17	5	20	6	B
8	4	19	11	B	18	3	19	15	
9	2	15	5	P	19	18	8	14	
10	11	14	6		20	0	14	17	

WOULD YOU LIKE TO PLAY ANOTHER GAME? Y

HANG ON A BIT WHILE I SET THIS UP

----START OF NEXT HOUR---

CURRENT ROOM IS 10

TUNNELS LEAD TO 14 8 13

YOU HAVE ENOUGH SUPPLIES FOR 10 MORE HOURS

SHOOT OR MOVE? M

WHERE TO? 8

DUCK!! BAT MIGRATION, ONE COLONY OF BATS HAS MOVED

YOU LOSE SOME SUPPLIES WHILE HIDING

LISTEN!! A ROCK SLIDE HAS CLOSED A TUNNEL

LOOK, YOU FOUND SUPPLIES LEFT BY A

PREVIOUSLY (EATEN) EXPLORER

---START OF NEXT HOUR---

CURRENT ROOM IS 8

TUNNELS LEAD TO 10 0 20

YOU HAVE ENOUGH SUPPLIES FOR 12 MORE HOURS

SHOOT OR MOVE? M

WHERE TO? 20

---START OF NEXT HOUR---

<<< I FEEL A DRAFT >>>

CURRENT ROOM IS 20

TUNNELS LEAD TO 7 12 8

YOU HAVE ENOUGH SUPPLIES FOR 11 MORE HOURS

SHOOT OR MOVE? M

WHERE TO? 7

LISTEN!! A ROCK SLIDE HAS CLOSED A TUNNEL

---START OF NEXT HOUR---

CURRENT ROOM IS 7

TUNNELS LEAD TO 5 14 20

YOU HAVE ENOUGH SUPPLIES FOR 10 MORE HOURS

SHOOT OR MOVE? M

WHERE TO? 5

LOOK, YOU FOUND SUPPLIES LEFT BY
A PREVIOUSLY (EATEN) EXPLORER

---START OF NEXT HOUR---

<<< I HEAR WINGS >>>

CURRENT ROOM IS 5
TUNNELS LEAD TO 18 16 7
YOU HAVE ENOUGH SUPPLIES FOR 13 MORE HOURS

SHOOT OR MOVE? M

WHERE TO? 16

DUCK!! BAT MIGRATION, ONE COLONY OF BATS HAS MOVED
YOU LOSE SOME SUPPLIES WHILE HIDING
WHOOPS, BATS RELOCATE YOU.
YOU LOSE SOME SUPPLIES.

---START OF NEXT HOUR---

CURRENT ROOM IS 15
TUNNELS LEAD TO 18 19 6
YOU HAVE ENOUGH SUPPLIES FOR 9 MORE HOURS

SHOOT OR MOVE? M

WHERE TO? 6

DUCK!! BAT MIGRATION, ONE COLONY OF BATS HAS MOVED
YOU LOSE SOME SUPPLIES WHILE HIDING
LOOK, YOU FOUND SUPPLIES LEFT BY A
PREVIOUSLY (EATEN) EXPLORER

---START OF NEXT HOUR---

CURRENT ROOM IS 6
TUNNELS LEAD TO 15 4 17
YOU HAVE ENOUGH SUPPLIES FOR 9 MORE HOURS

SHOOT OR MOVE? M

WHERE TO? 4

---START OF NEXT HOUR---

<<<I SMELL A WUMPUS >>>

CURRENT ROOM IS 4
TUNNELS LEAD TO 2 11 6
YOU HAVE ENOUGH SUPPLIES FOR 8 MORE HOURS

SHOOT OR MOVE? S

HOW MANY ROOMS DO YOU WISH TO SHOOT THROUGH? 1
ENTER THE FIRST ROOM NUMBER: 2

WATCH IT, THE WUMPUS IS AWAKE!

LISTEN!! A ROCK SLIDE HAS CLOSED A TUNNEL.
C H O M P M U N C H MUNCH MUNCH GULP
THE WUMPUS GOTCHA
YOU LOSE (HEE HEE)
WOULD YOU LIKE TO SEE A MAP OF THE CAVES? YES

ROOM	TUNNELS			ITEM	ROOM	TUNNELS			ITEM
1	0	12	11		11	1	4	19	
2	9	13	4		12	20	1	16	P
3	14	17	18	P	13	10	2	17	
4	2	11	6	W	14	10	3	7	B
5	18	16	7		15	18	19	0	
6	0	4	17		16	12	5	19	B
7	5	14	20		17	13	3	6	
8	10	0	20		18	3	15	5	
9	0	2	0		19	11	15	16	
10	14	8	13		20	7	12	8	

WOULD YOU LIKE TO PLAY ANOTHER GAME? Y

HANG ON A BIT WHILE I SET THIS UP

---START OF NEXT HOUR---

<<< I HEAR WINGS >>>
<<< I FEEL A DRAFT >>>

CURRENT ROOM IS 15
TUNNELS LEAD TO 16 18 12
YOU HAVE ENOUGH SUPPLIES FOR 10 MORE HOURS

SHOOT OR MOVE? M

WHERE TO ? 125
MUST BE A ROOM # FROM 1 TO 20, TRY AGAIN: 2
CAN'T GET THERE FROM HERE
WHERE TO? 16

LISTEN!! A ROCK SLIDE HAS CLOSED A TUNNEL

---START OF NEXT HOUR----

<<< I HEAR WINGS >>>

CURRENT ROOM IS 16
TUNNELS LEAD TO 4 0 20
YOU HAVE ENOUGH SUPPLIES FOR 9 MORE HOURS

SHOOT OR MOVE? XXX
PLEASE ANSWER SHOOT OR MOVE

SHOOT OR MOVE? S

HOW MANY ROOMS DO YOU WISH TO SHOOT THROUGH? 10
NUMBER MUST BE A NUMBER FROM 1 TO 5
HOW MANY ROOMS DO YOU WISH TO SHOOT THROUGH? 5
ENTER THE FIRST ROOM NUMBER: 1
ENTER THE NEXT ROOM NUMBER: 2
ENTER THE NEXT ROOM NUMBER: 3
ENTER THE NEXT ROOM NUMBER: 4
ENTER THE NEXT ROOM NUMBER: 5

WATCH IT, THE WUMPUS IS AWAKE!
WATCH IT, WILD SHOT!

LISTEN!! A ROCK SLIDE HAS CLOSED A TUNNEL
LOOK, YOU FOUND SUPPLIES LEFT BY A
PREVIOUSLY (EATEN) EXPLORER

---START OF NEXT HOUR---

<<< I HEAR WINGS >>>

CURRENT ROOM IS 16
TUNNELS LEAD TO 20 4 0
YOU HAVE ENOUGH SUPPLIES LEFT FOR 11 MORE HOURS

SHOOT OR MOVE? S

HOW MANY ROOMS DO YOU WISH TO SHOOT THROUGH? 2
ENTER THE FIRST ROOM NUMBER: 4
ENTER THE NEXT ROOM NUMBER: 16

NICE GOING, TURKEY, YOU SHOT YOURSELF IN THE LEG
AND HAVE USED MEDICAL SUPPLIES.

---START OF NEXT HOUR---

<<< I HEAR WINGS >>>

CURRENT ROOM IS 16
TUNNELS LEAD TO 0 20 4
YOU HAVE ENOUGH SUPPLIES FOR 4 MORE HOURS

SHOOT OR MOVE? M

WHERE TO? 4

RATS FROM THE PITS EAT HALF YOUR SUPPLIES!!
WHOOPS, BATS RELOCATE YOU
YOU LOSE SOME SUPPLIES.

---START OF NEXT HOUR---

CURRENT ROOM IS 9

TUNNELS LEAD TO 2 11 8

YOU HAVE ENOUGH SUPPLIES FOR 1 MORE HOUR

SHOOT OR MOVE? M

WHERE TO? 2

YOU HAVE RUN OUT OF SUPPLIES AND WILL STARVE.

YOU LOSE (HEE HEE)

WOULD YOU LIKE TO SEE A MAP OF THE CAVES? N

WOULD YOU LIKE TO PLAY ANOTHER GAME? N

THANK YOU FOR PLAYING, COME AGAIN SOMETIME.

READY

Appendix B:

6800 Assembler Source Listing

BASIC Source Listing

6800 Assembler Source Listing

```

(0020)          ORG $20
(0020) 7E 00 00 | JMP START
(0023)          | ARRAY RMB 5      ROOM SEQUENCE
(0028)          | ARRAYNO RMB 2     ARRAY POINTER
(002A)          | AWAKE RMB 1      AWAKE SW
(0020)          | BLANK EQU $20
(002B)          | COUNT RMB 1     GENERAL COUNTER
(000D)          | CR EQU $0D     CARRIAGE RETURN
(002C)          | CURRENT RMB 1   CURRENT HUNTER LOCATION
(002D)          | DAYS RMB 1     DAYS LEFT
(002E)          | DELIM RMB 1    END OF INPUT DELIMITER
(002F)          | END RMB 1      GAME OVER SW
(0004)          | EOT EQU 4      END OF STRING
(000A)          | LF EQU $0A     LINE FEED
(0030)          | ULDRROOM RMB 1  SAVE ROOM NO
(0031)          | ROCKS RMB 1      ROCK COUNTER
(0032)          | ROOMNO RMB 1   GENERAL ROOM NO
(0033)          | ROOMTLY RMB 1  GENERAL ROOM COUNTER
(0034)          | SAVX RMB 2     SAVE IX
(0036)          | SHOTS RMB 1   NO OF SHOTS LEFT
(0037)          | STOP RMB 1    STOP ARROW SW
(0038)          | STUF RMB 4     RANDOM STUPH FOR RANDOM NUMBER GENERATOR
(003C)          | SYMBOL RMB 1   GENERAL SYMBOL HOLDER
(003D)          | TEST RMB 1    TEST ROOM FOR SHOOTING SEQUENCE
(003E)          | WILD RMB 1    WILD ARROW IND
(003F)          | WUMPROOM RMB 1  CURRENT WUMPUS LOCATION
              | **SKIP
              | *
              | *
(0040) 02 05 06 | ROOMS FCB 2,5,6,
(0043) 00       |
(0044) 01 03 07 | FCB 1,3,7,
(0047) 00       |
(0048) 02 04 08 | FCB 2,4,8,
(004B) 00       |
(004C) 03 05 09 | FCB 3,5,9,
(004F) 00       |
(0050) 01 04 0A | FCB 1,4,10,
(0053) 00       |
(0054) 01 0B 0C | FCB 1,11,12,
(0057) 00       |
(0058) 02 0C 0D | FCB 2,12,13,
(005B) 00       |
(005C) 03 0D 0E | FCB 3,13,14,
(005F) 00       |
(0060) 04 0E 0F | FCB 4,14,15,
(0063) 00       |
(0064) 05 0B 0F | FCB 5,11,15,
(0067) 00       |
(0068) 06 0A 11 | FCB 6,10,17,
(006B) 00       |
(006C) 06 07 12 | FCB 6,7,18,
(006F) 00       |
(0070) 07 08 13 | FCB 7,8,19,
(0073) 00       |
(0074) 08 09 14 | FCB 8,9,20,
(0077) 00       |
(0078) 09 0A 10 | FCB 9,10,16,
(007B) 00       |
(007C) 0F 11 14 | FCB 15,17,20,
(007F) 00       |
(0080) 0B 10 12 | FCB 11,16,18,
(0083) 00       |
(0084) 0C 11 13 | FCB 12,17,19,
(0087) 00       |
(0088) 0D 12 14 | FCB 13,18,20,
(008B) 00       |
(008C) 0E 10 13 | FCB 14,16,19,
(008F) 00       |
              | *
(0090) 01 01     | TRANS FCB 1,1
(0092) 02 02     | FCB 2,2
(0094) 03 03     | FCB 3,3
(0096) 04 04     | FCB 4,4
(0098) 05 05     | FCB 5,5
(009A) 06 06     | FCB 6,6
(009C) 07 07     | FCB 7,7
(009E) 08 08     | FCB 8,8
(00A0) 09 09     | FCB 9,9
(00A2) 0A 0A     | FCB 10,10
(00A4) 0B 0B     | FCB 11,11

```

(00A6)	0C	0C		FCB	12,12	
(00A8)	0D	0D		FCB	13,13	
(00AA)	0E	0E		FCB	14,14	
(00AC)	0F	0F		FCB	15,15	
(00AE)	10	10		FCB	16,16	
(00B0)	11	11		FCB	17,17	
(00B2)	12	12		FCB	18,18	
(00B4)	13	13		FCB	19,19	
(00B6)	14	14		FCB	20,20	
* *						
(00B8)	21		PROB1	FCB	33	ARROW AMONG BATS WILL HIT ONE
(00B9)	21		PROB2	FCB	33	ARROW OVER PIT WILL FALL IN
(00BA)	14		PROB3	FCB	20	ARROW HITTING HUNTER WON'T KILL
(00BB)	05		PROB4	FCB	05	BAT MIGRATION
(00BC)	0A			FCB	10	FIND THROWING ROCK
(00BD)	05			FCB	05	RATS EAT SUPPLIES
(00BE)	05			FCB	05	ROCK SLIDE
(00BF)	08			FCB	08	FIND MORE SUPPLIES
(00C0)	21		PROB8	FCB	33	THROWN ROCK WILL KILL WUMPUS
* *						
(00C1)	7E	E1	AC	CHARIN	JMP	\$E1AC
(00C4)	7E	E1	D1	CHAROUT	JMP	\$F1D1
(00C7)	36			STROUT	PSHA	
(00C8)	8D	E0	7E		JSR	\$E07E
(00CB)	32				PULA	
(00CC)	39				RTS	
(00CD)	36			BLKOUT	PSHA	
(00CE)	8D	E0	CC		JSR	\$E0CC
(00D1)	32				PULA	
(00D2)	39				RTS	
* *						
(0100)				ORG	\$100	
(0100)	7E	00	00	START	JMP	MAIN
(0021)	01	00				
**SKIP * *						
(0103)	0D	0A	00	CHLF	FCB	CR,LF,,EOT
(0106)	04					
(0107)	0D	0A	0A	TX01	FCB	CR,LF,LF,
(010A)	00					
(010B)	43	55	52		FCC	/CURRENT ROOM IS:/
(010E)	52	45	4E			
(0111)	54	20	52			
(0114)	4F	4F	4D			
(0117)	20	49	53			
(011A)	3A					
(011B)	04				FCB	EOT
(011C)	0D	0A	00	TX02	FCB	CR,LF,,
(011F)	00					
(0120)	54	55	4E		FCC	/TUNNELS LEAD TO:/
(0123)	4E	45	4C			
(0126)	53	20	4C			
(0129)	45	41	44			
(012C)	20	54	4F			
(012F)	3A					
(0130)	04				FCB	EOT
(0131)	0D	0A	0A	TX03	FCB	CR,LF,LF,
(0134)	00					
(0135)	4D	4F	56		FCC	/MOVE OR SHOOT? /
(0138)	45	20	4F			
(013B)	52	20	53			
(013E)	48	4F	4F			
(0141)	54	3F	20			
(0144)	04				FCB	EOT
(0145)	20	57	48	TX04	FCC	/ WHERE? /
(0148)	45	52	45			
(014B)	3F	20				
(014D)	04				FCB	EOT
(014E)	0D	0A	00	TX05	FCB	CR,LF,,
(0151)	00					
(0152)	49	20	48		FCC	/I HEAR WINGS/
(0155)	45	41	52			
(0158)	20	57	49			
(015B)	4C	47	53			
(015E)	04				FCB	EOT
(015F)	0D	0A	00	TX06	FCB	CR,LF,,
(0162)	00					
(0163)	49	20	46		FCC	/I FEEL A DRAFT/
(0166)	45	45	4C			

(0169)	20	41	20		
(016C)	44	52	41		
(016F)	46	54			
(0171)	04				FCB EOT
(0172)	00	0A	00	TX07	FCB CR,LF,,
(0175)	00				
(0176)	49	20	53		FCC /I SMELL A WUMPUS!//
(0179)	40	45	4C		
(017C)	4C	20	41		
(017F)	20	57	55		
(0182)	40	50	55		
(0185)	53	21			
(0187)	04				FCB EOT
				**SKIP	
(0188)	00	0A	00	TX08	FCB CR,LF,,
(018B)	00				
(018C)	59	4F	55		FCC /YOU HAVE RUN OUT OF SUPPLIES AND WILL STARVE/
(018F)	20	48	41		
(0192)	56	45	20		
(0195)	52	55	4E		
(0198)	20	4F	55		
(019B)	54	20	4F		
(019E)	46	20	53		
(01A1)	55	50	50		
(01A4)	4C	49	45		
(01A7)	53	20	41		
(01AA)	4E	44	20		
(01AD)	57	49	4C		
(01B0)	4C	20	53		
(01B3)	54	41	52		
(01B6)	56	45			
(01B8)	04				FCB EOT
(01B9)	00	0A	00	TX09	FCB CR,LF,,
(01BC)	00				
(01BD)	59	59	59		FCC /YYYYIIIIIIIIIIIIIIIIIIII.... YOU FELL INTO A PIT/
(01C0)	49	49	49		
(01C3)	49	45	45		
(01C6)	45	45	45		
(01C9)	45	2E	2E		
(01CC)	2E	2E	20		
(01CF)	59	4F	55		
(01D2)	20	46	45		
(01D5)	4C	4C	20		
(01D8)	49	4E	54		
(01DB)	4F	20	41		
(01DE)	20	50	49		
(01E1)	54				
(01E2)	04				FCB EOT
(01E3)	00	0A	00	TX10	FCB CR,LF,,
(01E6)	00				
(01E7)	41	41	52		FCC /AARRRRGGGGHHH.... YOU HAVE SHOT YOURSELF/
(01EA)	52	52	52		
(01ED)	47	47	47		
(01F0)	47	48	48		
(01F3)	48	2E	2E		
(01F6)	2E	2E	20		
(01F9)	59	4F	55		
(01FC)	20	48	41		
(01FF)	56	45	20		
(0202)	53	48	4F		
(0205)	54	20	59		
(0208)	4F	55	52		
(020B)	53	45	4C		
(020E)	46				
(020F)	04				FCB EOT
				**SKIP	
(0210)	00	0A	00	TX11	FCB CR,LF,,
(0213)	00				
(0214)	43	20	48		FCC /C H O M P CRUMP MUNCH GULP!//
(0217)	20	4F	20		
(021A)	40	20	50		
(021D)	20	20	43		
(0220)	52	55	40		
(0223)	50	20	40		
(0226)	55	4E	43		
(0229)	48	20	47		
(022C)	55	4C	50		
(022F)	21				
(0230)	00	0A	00		FCB CR,LF,,
(0233)	00				
(0234)	20	20	54		FCC / THE WUMPUS GOT YOU!//
(0237)	48	45	20		

(023A)	57	55	4D			
(023D)	50	55	53			
(0240)	20	47	4F			
(0243)	54	20	59			
(0246)	4F	55	21			
(0249)	04					
(024A)	0D	0A	00		TX12	FCB EOT
(024D)	00					FCB CR,LF,,
(024E)	59	4F	55			FCC /YOU LOSE (HEE HEE)/
(0251)	20	4C	4F			
(0254)	53	45	20			
(0257)	28	48	45			
(025A)	45	20	48			
(025D)	45	45	29			
(0260)	04					FCB EOT
(0261)	0D	0A	00		TX13	FCB CR,LF,,
(0264)	00					
(0265)	42	20	4F			FCC /B O N K ! /
(0268)	20	4E	20			
(026B)	48	20	21			
(026E)	20					
(026F)	04					FCB EOT
(0270)	0D	0A	00		TX14	FCB CR,LF,,
(0273)	00					
(0274)	47	4F	4F			FCC /GOOD FOR YOU! - YOU GOT HIM/
(0277)	44	20	46			
(027A)	4F	52	20			
(027D)	59	4F	55			
(0280)	21	20	2D			
(0283)	20	59	4F			
(0286)	55	20	47			
(0289)	4F	54	20			
(028C)	48	49	4D			
(028F)	04					FCB EOT
(0290)	20	57	49		TX15	FCC / WITH A ROCK!/
(0293)	54	48	20			
(0296)	41	20	52			
(0299)	4F	43	48			
(029C)	21					
(029D)	04					FCB EOT
					**SKIP	
(029E)	0D	0A	00		TX16	FCB CR,LF,,
(02A1)	00					
(02A2)	53	55	50			FCC /SUPPLIES WILL LAST /
(02A5)	50	4C	49			
(02A8)	45	53	20			
(02AB)	57	49	4C			
(02AE)	4C	20	4C			
(02B1)	41	53	54			
(02B4)	20					
(02B5)	04					FCB EOT
(02B6)	20	44	41		TX17	FCC / DAYS/
(02B9)	59	53				
(02BB)	04					FCB EOT
(02BC)	0D	0A	00		TX18	FCB CR,LF,,
(02BF)	00					
(02C0)	42	41	54			FCC /BAT MIGRATION - HIDE AND WAIT/
(02C3)	20	4D	49			
(02C6)	47	52	41			
(02C9)	54	49	4F			
(02CC)	4E	20	2D			
(02CF)	20	48	49			
(02D2)	44	45	20			
(02D5)	41	4E	44			
(02D8)	20	57	41			
(02DB)	49	54				
(02DD)	0D	0A	00			FCB CR,LF,,
(02E0)	00					
(02E1)	20	20	4F			FCC / ONE COLONY OF BATS HAS MOVED/
(02E4)	4E	45	20			
(02E7)	43	4F	4C			
(02EA)	4F	4E	59			
(02ED)	20	4F	46			
(02F0)	20	42	41			
(02F3)	54	53	20			
(02F6)	48	41	53			
(02F9)	20	4D	4F			
(02FC)	56	45	44			
(02FF)	04					FCB EOT
					**SKIP	
(0300)	0D	0A	00		TX19	FCB CR,LF,,
(0303)	00					
(0304)	4E	49	43			FCC /NICE GOING, YOU SHOT YOURSELF/

(0307)	45	20	47		
(030A)	4F	49	4E		
(030D)	47	2C	20		
(0310)	59	4F	55		
(0313)	20	53	48		
(0316)	4F	54	20		
(0319)	59	4F	55		
(031C)	52	53	45		
(031F)	4C	46			
(0321)	0D	0A	00		FCB CR,LF,,
(0324)	00				
(0325)	20	20	41		FCC / AND HAVE USED MEDICAL SUPPLIES/
(0328)	4E	44	20		
(032B)	48	41	56		
(032E)	45	20	55		
(0331)	53	45	44		
(0334)	20	4D	45		
(0337)	44	49	43		
(033A)	41	4C	20		
(033D)	53	55	50		
(0340)	50	4C	49		
(0343)	45	53			
(0345)	04				FCB EOT
(0346)	0D	0A	00		FCB CR,LF,,
(0349)	00				TX20
(034A)	57	48	4F		FCC /WHOOOPS! BATS RELOCATE YOU/
(034D)	4F	4F	50		
(0350)	53	21	20		
(0353)	42	41	54		
(0356)	53	20	52		
(0359)	45	4C	4F		
(035C)	43	41	54		
(035F)	45	20	59		
(0362)	4F	55			
(0364)	0D	0A	00		FCB CR,LF,,
(0367)	00				
(0368)	20	20	59		FCC / YOU LOST SOME SUPPLIES/
(036B)	4F	55	20		
(036E)	4C	4F	53		
(0371)	54	20	53		
(0374)	4F	4D	45		
(0377)	20	53	55		
(037A)	50	50	4C		
(037D)	49	45	53		
(0380)	04				FCB EOT
					**SKIP
(0381)	0D	0A	00		TX21
(0384)	00				FCB CR,LF,,
(0385)	54	48	55		FCC /THUD! YOU ONLY DAZED HIM/
(0388)	44	21	20		
(038B)	59	4F	55		
(038E)	20	4F	4E		
(0391)	4C	59	20		
(0394)	44	41	5A		
(0397)	45	44	20		
(039A)	48	49	4D		
(039D)	04				FCB EOT
(039E)	0D	0A	00		FCB CR,LF,,
(03A1)	00				TX22
(03A2)	4D	49	53		FCC /MISSED/
(03A5)	53	45	44		
(03A8)	04				FCB EOT
(03A9)	0D	0A	00		FCB CR,LF,,
(03AC)	00				TX23
(03AD)	4C	4F	4F		FCC /LOOK, YOU FOUND /
(03B0)	48	2C	20		
(03B3)	59	4F	55		
(03B6)	20	46	4F		
(03B9)	55	4E	44		
(03BC)	20				
(03BD)	04				FCB EOT
(03BE)	41	20	54		TX24
(03C1)	48	52	4F		FCC /A THROWING ROCK/
(03C4)	57	49	4E		
(03C7)	47	20	52		
(03CA)	4F	43	4R		
(03CD)	04				FCB EOT
(03CE)	53	55	50		TX25
(03D1)	50	4C	49		FCC /SUPPLIES/
(03D4)	45	53			
(03D6)	0D	0A	00		FCB CR,LF,,
(03D9)	00				

(03DA)	20	20	46		FCC	/ FROM ANOTHER (EATEN) HUNTER/
(03DD)	52	4F	4D			
(03E0)	20	41	4E			
(03E3)	4F	54	48			
(03E6)	45	52	20			
(03E9)	28	45	41			
(03EC)	54	45	4E			
(03EF)	29	20	48			
(03F2)	55	4E	54			
(03F5)	45	52				
(03F7)	04				FCB	EOT
(03F8)	0D	0A	00	**SKIP		
(03FB)	00			TX26	FCB	CR,LF,,
(03FC)	52	41	54		FCC	/RATS EAT HALF YOUR SUPPLIES/
(03FF)	53	20	45			
(0402)	41	54	20			
(0405)	48	41	4C			
(0408)	46	20	59			
(040B)	4F	55	52			
(040E)	20	53	55			
(0411)	50	50	4C			
(0414)	49	45	53			
(0417)	04				FCB	EOT
(0418)	0D	0A	00	TX27	FCB	CR,LF,,
(041B)	00					
(041C)	52	4F	43		FCC	/ROCK SLIDE! A TUNNEL IS CLOSED/
(041F)	4B	20	53			
(0422)	4C	49	44			
(0425)	45	21	20			
(0428)	41	20	54			
(042B)	55	4E	4E			
(042E)	45	4C	20			
(0431)	49	53	20			
(0434)	43	4C	4F			
(0437)	53	45	44			
(043A)	04				FCB	EOT
(043B)	57	41	54	TX28	FCC	/WATCH IT!/
(043E)	43	4B	20			
(0441)	49	54	21			
(0444)	04				FCB	EOT
(0445)	20	2D	20	TX29	FCC	/ - THE WUMPUS IS AWAKE/
(0448)	54	48	45			
(044B)	20	57	55			
(044E)	4D	50	55			
(0451)	53	20	49			
(0454)	53	20	41			
(0457)	57	41	4B			
(045A)	45					
(045B)	04				FCB	EOT
(045C)	0D	0A	00	TX30	FCB	CR,LF,,
(045F)	00					
(0460)	57	49	4C		FCC	/WILD SHOT - /
(0463)	44	20	53			
(0466)	48	4F	54			
(0469)	20	2D	20			
(046C)	04				FCB	EOT
(046D)	0D	0A	00	TX31	FCB	CR,LF,,
(0470)	00					
(0471)	42	49	47		FCC	/BIG DEAL, YOU SHOT A BAT/
(0474)	20	44	45			
(0477)	41	4C	2C			
(047A)	20	59	4F			
(047D)	55	20	53			
(0480)	48	4F	54			
(0483)	20	41	20			
(0486)	42	41	54			
(0489)	04				FCB	EOT
(048A)	0D	0A	00	**SKIP		
(048D)	00			TX32	FCB	CR,LF,,
(048E)	41	20	44			
(0491)	4F	57	4E		FCC	/A DOWNDRAFT HAS SUCKED THE ARROW INTO A PIT/
(0494)	44	52	41			
(0497)	46	54	20			
(049A)	48	41	53			
(049D)	20	53	55			
(04A0)	43	4B	45			
(04A3)	44	20	54			
(04A6)	48	45	20			
(04A9)	41	52	52			
(04AC)	4F	57	20			

(04AF)	49	4E	54		
(04B2)	4F	20	41		
(04B5)	20	50	49		
(04B8)	54				
(04B9)	04				FCB EOT
(04BA)	0D	0A	00	TX33	FCB CR,LF,,
(04BD)	00				
(04BE)	59	4F	55		FCC /YOU JUST STEPPED ON HIS FLIPPER! /
(04C1)	20	4A	55		
(04C4)	53	54	20		
(04C7)	53	54	45		
(04CA)	50	50	45		
(04CD)	44	20	4F		
(04D0)	4E	20	48		
(04D3)	49	53	20		
(04D6)	46	4C	49		
(04D9)	50	50	45		
(04DC)	52	21			
(04DE)	04				FCB EOT
(04DF)	0D	0A	0A	TX34	FCB CR,LF,LF,,
(04E2)	00				
(04E3)	44	4F	20		FCC /DO YOU WANT TO PLAY AGAIN? /
(04E6)	59	4F	55		
(04E9)	20	57	41		
(04EC)	4E	54	20		
(04EF)	54	4F	20		
(04F2)	50	4C	41		
(04F5)	59	20	41		
(04F8)	47	41	49		
(04FB)	4E	3F	20		
(04FE)	04				FCB EOT
(04FF)	0D	0A	00	TX35	FCB CR,LF,,
(0502)	00				
(0503)	44	4F	20		FCC /DO YOU WANT TO SEE A CAVE MAP? /
(0506)	59	4F	55		
(0509)	20	57	41		
(050C)	4E	54	20		
(050F)	54	4F	20		
(0512)	53	45	45		
(0515)	20	41	20		
(0518)	43	41	56		
(0518)	45	20	40		
(051E)	41	50	3F		
(0521)	20				
(0522)	04				FCB EOT
				**SKIP	
(0523)	0D	0A	00	TX36	FCB CR,LF,,
(0526)	00				
(0527)	57	45	4C		FCC /WELCOME TO THE WUMPUS CAVES. /
(052A)	43	4F	4D		
(052D)	45	20	54		
(0530)	4F	20	54		
(0533)	48	45	20		
(0536)	57	55	4D		
(0539)	50	55	53		
(053C)	20	43	41		
(053F)	56	45	53		
(0542)	2E				
(0543)	0D	0A	00		FCB CR,LF,,
(0546)	00				
(0547)	44	4F	20		FCC /DO YOU WISH INSTRUCTIONS? /
(054A)	59	4F	55		
(054D)	20	57	49		
(0550)	53	48	20		
(0553)	49	4E	53		
(0556)	54	52	55		
(0559)	43	54	49		
(055C)	4F	4E	53		
(055F)	3F	20			
(0561)	04				FCB EOT
(0562)	0A			WHAT?	FCB LF
(0563)	20	57	48		FCC / WHAT? /
(0566)	41	54	3F		
(0569)	20				
(056A)	04				FCB EOT
(056B)	0D	0A	00	TX37	FCB CR,LF,,
(056E)	00				
(056F)	54	48	41		FCC /THANK YOU, COME AGAIN SOMETIME. /
(0572)	4E	48	20		
(0575)	59	4F	55		
(0578)	2C	20	43		
(0578)	4F	4D	45		

(057E)	20	41	47		
(0581)	41	49	4E		
(0584)	20	53	4F		
(0587)	4D	45	54		
(058A)	49	4D	45		
(058D)	2E				
(058E)	04				FCB EOT
				**SKIP	
(058F)	0D	0A	00	TX38	FCB CR,LF,,
(0592)	00				
(0593)	53	48	4F		FCC /SHOOT WHAT?/
(0596)	4F	54	20		
(0599)	57	48	41		
(059C)	54	3F			
(059E)	0D	0A	00		FCB CR,LF,,
(05A1)	00				
(05A2)	59	4F	55		FCC /YOU HAVE NO ARROWS OR ROCKS/
(05A5)	20	48	41		
(05A8)	56	45	20		
(05AB)	4E	4F	20		
(05AE)	41	52	52		
(05B1)	4F	57	53		
(05B4)	20	4F	52		
(05B7)	20	52	4F		
(05BA)	43	48	53		
(05BD)	04				FCB EOT
(05BE)	20	2D	20	TX39	FCC / - YOU CAN'T GET THERE FROM HERE/
(05C1)	59	4F	55		
(05C4)	20	43	41		
(05C7)	4E	27	54		
(05CA)	20	47	45		
(05CD)	54	20	54		
(05D0)	48	45	52		
(05D3)	45	20	46		
(05D6)	52	4F	4D		
(05D9)	20	48	45		
(05DC)	52	45			
(05DE)	04				FCB EOT
(05DF)	0D	0A	0A	TX40	FCB CR,LF,LF,
(05E2)	00				
(05E3)	52	4D	20		FCC /RM TUNNELS ITEM/
(05E6)	20	20	20		
(05E9)	54	55	4E		
(05EC)	4E	45	4C		
(05EF)	53	20	20		
(05F2)	20	20	49		
(05F5)	54	45	4D		
(05F8)	0A	04			FCB LF,EOT
				**SKIP	
(05FA)	0D	0A	00	TX99	FCB CR,LF,,
(05FD)	00				
(05FE)	54	48	49		FCC /THIS CAVE HAS 20 INTERCONNECTED ROOMS/
(0601)	53	20	43		
(0604)	41	56	45		
(0607)	20	48	41		
(060A)	53	20	32		
(060D)	30	20	49		
(0610)	4E	54	45		
(0613)	52	43	4F		
(0616)	4E	4E	45		
(0619)	43	54	45		
(061C)	44	20	52		
(061F)	4F	4F	4D		
(0622)	53				
(0623)	0D	0A	00		FCB CR,LF,,
(0626)	00				
(0627)	54	48	45		FCC /THE WUMPUS IS ASLEEP IN ONE AND MUST BE KILLED/
(062A)	20	57	55		
(062D)	4D	50	55		
(0630)	53	20	49		
(0633)	53	20	41		
(0636)	53	4C	45		
(0639)	45	50	20		
(063C)	49	4E	20		
(063F)	4F	4E	45		
(0642)	20	41	4E		
(0645)	44	20	4D		
(0648)	55	53	54		
(064B)	20	42	45		
(064E)	20	48	49		
(0651)	4C	4C	45		
(0654)	44				
(0655)	0D	0A	00		FCB CR,LF,,

(0658)	00				
(0659)	49	46	20		FCC /IF HE (?) FINDS YOU HE WILL EAT YOU/
(065C)	48	45	20		
(065F)	28	3F	29		
(0662)	20	46	49		
(0665)	4E	44	53		
(0668)	20	59	4F		
(066B)	55	20	48		
(066E)	45	20	57		
(0671)	49	4C	4C		
(0674)	20	45	41		
(0677)	54	20	59		
(067A)	4F	55			
(067C)	0D	0A	00		FCB CR,LF,,
(067F)	00				
				**SKIP	
(0680)	49	46	20		FCC /IF YOU WAKE HIM UP HE MAY MOVE/
(0683)	59	4F	55		
(0686)	20	57	41		
(0689)	48	45	20		
(068C)	48	49	4D		
(068F)	20	55	50		
(0692)	20	48	45		
(0695)	20	4D	41		
(0698)	59	20	4D		
(069B)	4F	56	45		
(069E)	0D	0A	00		FCB CR,LF,,
(06A1)	00				
(06A2)	4C	4F	4F		FCC /LOOK OUT FOR BATS AND PITS/
(06A5)	48	20	4F		
(06A8)	55	54	20		
(06AB)	46	4F	52		
(06AE)	20	42	41		
(06B1)	54	53	20		
(06B4)	41	4E	44		
(06B7)	20	50	49		
(06BA)	54	53			
(06BC)	0D	0A	00		FCB CR,LF,,
(06BF)	00				
(06C0)	57	41	52		FCC /WARNINGS ARE FOR HAZARDS 1 ROOM AWAY/
(06C3)	4E	49	4E		
(06C6)	47	53	20		
(06C9)	41	52	45		
(06CC)	20	46	4F		
(06CF)	52	20	48		
(06D2)	41	5A	41		
(06D5)	52	44	53		
(06D8)	20	31	20		
(06DB)	52	4F	4F		
(06DE)	4D	20	41		
(06E1)	57	41	59		
(06E4)	0D	0A	00		FCB CR,LF,,
(06E7)	00				
(06E8)	59	4F	55		FCC /YOU HAVE 5 ARROWS AND A LIMITED STORE OF SUPPLIES/
(06EB)	20	48	41		
(06EE)	56	45	20		
(06F1)	35	20	41		
(06F4)	52	52	4F		
(06F7)	57	53	20		
(06FA)	41	4E	44		
(06FD)	20	41	20		
(0700)	4C	49	4D		
(0703)	49	54	45		
(0706)	44	20	53		
(0709)	54	4F	52		
(070C)	45	20	4F		
(070F)	46	20	53		
(0712)	55	50	50		
(0715)	4C	49	45		
(0718)	53				
(0719)	0D	0A	00		FCB CR,LF,,
(071C)	00				
				**SKIP	
(071D)	45	41	43		FCC /EACH SHOT MAY GO THROUGH 1 TO 3 CONNECTED ROOMS/
(0720)	48	20	53		
(0723)	48	4F	54		
(0726)	20	4D	41		
(0729)	59	20	47		
(072C)	4F	20	54		
(072F)	48	52	4F		
(0732)	55	47	48		
(0735)	20	31	20		

(0738)	54	4F	20		
(0738)	33	20	43		
(073E)	4F	4E	4E		
(0741)	45	43	54		
(0744)	45	44	20		
(0747)	52	4F	4F		
(074A)	4D	53			
(074C)	00	0A	00		FCB CR,LF,,
(074F)	00				
(0750)	59	4F	55		FCC /YOU MAY MAKE 1 MOVE OR SHOT EACH DAY/
(0753)	20	4D	41		
(0756)	59	20	4D		
(0759)	41	48	45		
(075C)	20	31	20		
(075F)	4D	4F	56		
(0762)	45	20	4F		
(0765)	52	20	53		
(0768)	48	4F	54		
(0768)	20	45	41		
(076E)	43	48	20		
(0771)	44	41	59		
(0774)	00	0A	00		FCB CR,LF,,
(0777)	00				
(0778)	57	48	45		FCC /WHEN YOU ARE OUT OF ARROWS LOOK FOR ROCKS/
(077B)	4E	20	59		
(077E)	4F	55	20		
(0781)	41	52	45		
(0784)	20	4F	55		
(0787)	54	20	4F		
(078A)	46	20	41		
(078D)	52	52	4F		
(0790)	57	53	20		
(0793)	4C	4F	4F		
(0796)	48	20	46		
(0799)	4F	52	20		
(079C)	52	4F	43		
(079F)	48	53			
(07A1)	00	0A	00		FCB CR,LF,,
(07A4)	00				
					**SKIP
(07A5)	20	20	57		FCC / WHICH CAN BE THROWN INTO ONLY 1 ROOM/
(07A8)	48	49	43		
(07AB)	48	20	43		
(07AE)	41	4E	20		
(07B1)	42	45	20		
(07B4)	54	48	52		
(07B7)	4F	57	4E		
(07BA)	20	49	4E		
(07BD)	54	4F	20		
(07C0)	4F	4E	4C		
(07C3)	59	20	31		
(07C6)	20	52	4F		
(07C9)	4F	4D			
(07CB)	0D	0A	00		FCB CR,LF,,
(07CE)	00				
(07CF)	20	20	41		FCC / AND MAY KILL THE WUMPUS/
(07D2)	4E	44	20		
(07D5)	4D	41	59		
(07D8)	20	4B	49		
(07DB)	4C	4C	20		
(07DE)	54	48	45		
(07E1)	20	57	55		
(07E4)	4D	50	55		
(07E7)	53				
(07E8)	0D	0A	0A		FCB CR,LF,LF,
(07EB)	00				
(07EC)	20	20	20		FCC / GOOD LUCK/
(07EF)	20	20	20		
(07F2)	20	20	20		
(07F5)	47	4F	4F		
(07F8)	44	20	4C		
(07FA)	55	43	4B		
(07FE)	0D	0A	0A		FCB CR,LF,LF,EOT
(0801)	04				
					**SKIP
					*
					*
(0802)	DF	34			PSHX STX SAVX SAVE IX
(0804)	30				TSX POINT IX
(0805)	09				DEX
(0806)	09				DEX
(0807)	AE	02			LDS 2,X MOVE RTS ADDR

(0809)	AF	00		STS	X	
(0808)	9E	34		LDS	SAVX	INSERT IX
(080D)	AF	02		STS	2,X	RESTORE STACK
(080F)	35			TXS		
(0810)	EE	02		LDS	2,X	RESTORE IX
(0812)	39			RTS		
* * *						
(0813)	30			PULX	TSX	POINT IX
(0814)	09				DEX	
(0815)	09				DEX	
(0816)	AE	04			LDS 4,X	REMOVE IX VALUE
(0818)	AF	00			STS X	
(081A)	AE	02			LDS 2,X	MOVE UP RTS ADDR
(081C)	AF	04			STS 4,X	RESTORE STACK
(081E)	35				TXS	
(081F)	31				INS	
(0820)	31				INS	
(0821)	31				INS	
(0822)	31				INS	
(0823)	EE	00			LDS X	LOAD IX
(0825)	39				RTS	
**SKIP * *						
(0826)	BD	08	02	ROOMIN	JSR PSX	SAVE IX
(0829)	C6	03			LDA #3	LOAD COUNTER
(082B)	D7	2B			STAB COUNT	
(082D)	7F	00	32		CLR ROOMNO	
(0830)	BD	00	C1	IN1	JSR CHARIN	GET CHARACTER
(0833)	81	20			CMPL #BLANK	IF BLANK THEN
(0835)	26	00			BNE IN2	
(0837)	D6	2B			LDA COUNT	
(0839)	C1	03			CMPL #3	IF COUNT =3 (LEADING BLANKS)
(083B)	27	F3			BEQ IN1	KEEP GOING
(083D)	20	00			BRA IN3	ELSE DONE
(083F)	81	0D		IN2	CMPL #CR	IF CR THEN
(0836)	08					
(0841)	27	00			BEQ IN3	DONE
(0843)	81	2C			CMPL #32C	IF COMMA THEN
(0845)	27	00			BEQ IN3	DONE
(0847)	81	30			CMPL #0	IF < 0 THEN
(0849)	2D	00			BLT IN5	ERROR
(084B)	81	39			CMPL #9	IF > 9 THEN
(084D)	22	00			BHI IN5	ERROR
(084F)	7A	00	2B		DEC COUNT	IF THIRD DIGIT THEN
(0852)	27	00			BEQ IN5	ERROR
(0854)	84	0F			ANDA #50F	STRIP OFF HIGH BITS
(0856)	36				PSHA	
(0857)	96	32			LDA ROOMNO	MULTIPLY ROOMNO
(0859)	16				TAB	BY 10
(085A)	48				ASLA	
(085B)	48				ASLA	
(085C)	48				ASLA	
(085D)	1B				ABA	
(085E)	1B				ABA	
(085F)	33				PULB	
(0860)	1B				ABA	ADD NEW DIGIT
(0861)	97	32			STAA ROOMNO	
(0863)	20	CB			BRA IN1	GET NEXT CHAR
**SKIP * * * * ROOMIN CONTINUED						
(0865)	97	2E		IN3	STAA DELIM	SAVE DELIMITER
(0842)	22					
(083E)	26					
(0846)	1E					
(0867)	96	32			LDA ROOMNO	
(0869)	27	00			BEQ IN45	
(086B)	CE	00	90		LDS #TRANS	LOOK UP
(086E)	A1	01		IN31	CMPL 1,X	TRANSLATION
(0870)	27	00			BEQ IN4	
(0872)	08				INX	
(0873)	08				INX	
(0874)	8C	00	BB		CPX #TRANS+40	IF FOUND
(0877)	26	F5			BNE IN31	DONE
(0879)	20	00			BRA IN5	ELSE ERROR
(087B)	A6	00		IN4	LDA X	
(0871)	09					
(087D)	BD	08	13	IN45	JSR PULX	RESTORE IX

(086A)	12						
(0880)	39				RTS		
(0881)	CE	01	03	IN5	LDX	#CRLF	
(087A)	06						
(084A)	36						
(084E)	32						
(0853)	2D						
(0884)	BD	00	C7		JSR	STROUT	
(0887)	CE	01	45		LDX	#TX04	WRITE ERROR
(088A)	BD	00	C7		JSR	STROUT	MESSAGE
(088D)	20	9A			BRA	ROOMIN+3	TRY AGAIN
					**SKIP		
					*		
					*		
(088F)	4D			ROOMOUT	TSTA		
(0890)	2A	00			BPL	OUT0	
(0892)	BD	00	CD		JSR	BLKOUT	IF BLOCKED TUNNEL THEN
(0895)	BD	00	CD		JSR	BLKOUT	WRITE SPACES
(0898)	BD	00	CD		JSR	BLKOUT	
(089B)	39				RTS		
(089C)	BD	08	02	OUT0	JSR	PSHX	SAVE IX
(0891)	0A						
(089F)	BD	00	CD		JSR	BLKOUT	WRITE BLANK
(08A2)	CE	00	90		LDX	#TRANS	IF A = 1
(08A5)	4A				DECA		
(08A6)	27	00			BEQ	OUT5	GO TO END
(08A8)	08			OUT1	INX		LOOP THROUGH
(08A9)	08				INX		TABLE
(08AA)	4A				DECA		
(08AB)	26	FB			BNE	OUT1	
(08AD)	A6	01		OUT5	LDAA	1,X	TRANSLATE ROOMNO
(08A7)	05						
(08AF)	81	09			CMPA	#9	
(08B1)	22	00			BHI	OUT7	
(08B3)	BD	00	CD		JSR	BLKOUT	
(08B6)	BD	00	00	OUT7	JSR	DECOUT	WRITE ROOM
(08B2)	03						
(08B9)	BD	08	13		JSR	PULX	RESTORE IX
(08BC)	39				RTS		
					*		
					*		
					*		
(08BD)	BD	08	02	DAYSLEFT	JSR	PSHX	SAVE IX
(08C0)	CE	02	9E		LDX	#TX16	MSG1
(08C3)	BD	00	C7		JSR	STROUT	
(08C6)	96	2D			LDAA	DAYS	
(08C8)	BD	00	00		JSR	DECOUT	DAYS OUT
(08CB)	CE	02	B6		LDX	#TX17	MSG2
(08CE)	BD	00	C7		JSR	STROUT	
(08D1)	BD	08	13		JSR	PULX	RESTORE IX
(08D4)	39				RTS		
					*		
					*		
					*		
(08D5)	7F	00	2B	DECOUT	CLR	COUNT	CLEAR COUNT
(08C9)	08	D5					
(08B7)	08	D5					
(08D8)	7C	00	2B	DEC1	INC	COUNT	LOAD COUNT
(08DB)	80	0A			SUBA	#10	WITH TENS DIGIT
(08DD)	2A	F9			BPL	DEC1	
(08DF)	88	0A			ADDA	#10	
(08E1)	7A	00	2B		DEC	COUNT	
(08E4)	36				PSHA		SAVE UNITS DIGIT
(08E5)	96	28			LDAA	COUNT	IF COUNT
(08E7)	27	00			BEQ	DEC2	NOT = 0
(08E9)	8A	30			ORAA	#530	MAKE ASCII
(08EB)	BD	00	C4		JSR	CHAROUT	AND PRINT
(08EE)	32			DEC2	PULA		LOAD UNITS
(08E8)	05						
(08EF)	8A	30			ORAA	#530	MAKE ASCII
(08F1)	BD	00	C4		JSR	CHAROUT	AND PRINT
(08F4)	39				RTS		
					**SKIP		
					*		
					*		
					*		
(08F5)	37			RAND	PSHB		
(08F6)	96	39			LDAA	STUF+1	RANDOM NUMBER GENERATOR - SAVE B
(08F8)	0C				CLC		COMPUTE (STUF * 2 ** 9) MOD 2 ** 16
(08F9)	49				ROLA		
(08FA)	0C				CLC		
(08FB)	49				ROLA		
(08FC)	9B	38			ADDA	STUF	ADD STUFF TO RESULT

(08FE)	D6	39			LDAB STUF+1	
(0900)	0C				CLC	MULTIPLY BY 2 ** 2
(0901)	59				ROLB	
(0902)	49				ROLA	
(0903)	0C				CLC	
(0904)	59				ROLB	
(0905)	49				ROLA	
(0906)	0C				CLC	
(0907)	08	39			ADDB STUF+1	ADD STUFF TO RESULT
(0909)	99	38			ADCA STUF	
(0908)	0C				CLC	
(090C)	C8	19			ADDB #\$19	ADD HEXIDECIMAL 3619 TO THE RESULT
(090E)	88	36			ADDA #\$36	
(0910)	97	38			STAA STUF	STORE RESULT IN STUF
(0912)	D7	39			STAB STUF+1	
(0914)	33				PULB	RESTORE B
(0915)	39				RTS	RETURN
(0916)					RMB 5	LEAVE ROOM FOR OTHER RANDOM NUMBER GENERATORS
					**SKIP	
					*	
					*	
(0918)	97	30			RANDMOVE STAA OLDROOM	SAVE CURRENT ROOM
(0910)	86	32			LDAA #50	SET LOOP COUNTER
(091F)	97	28			STAA COUNT	TO 50
(0921)	DF	34			STX SAVX	SAVE CURRENT IX
(0923)	DE	34			RMV1 LDX SAVX	LOOP
(0925)	7A	00	28		DEC COUNT	PICK FIRST, SECOND,
(0928)	8D	08	F5		JSR RAND	OR THIRD ROOM
(0928)	81	55			CMPA #85	
(092D)	23	00			BLS RMV5	
(092F)	08				INX	
(0930)	81	AA			CMPA #170	
(0932)	23	00			BLS RMV5	
(0934)	08				INX	
(0935)	7D	00	28		RMV5 TST COUNT	IF 50 TRIES,
(092E)	06					
(0933)	01					
(0938)	27	00			BEQ RMV7	DON'T MOVE
(093A)	A6	00			LDAA X	IF BLOCKED
(093C)	28	E5			BMI RMV1	GO BACK TO LOOP
(093E)	8D	00	00		JSR PNTROOM	POINT IX TO ROOM
(0941)	6D	03			TST 3,X	IF ROOM EMPTY,
(0943)	27	00			BEQ RMV9	GO TO END
(0945)	5D				TSTB	ELSE IF WUMPUS MOVING
(0946)	26	DB			BNE RMV1	GO BACK TO LOOP
(0948)	20	00			BRA RMV9	
(094A)	96	30			RMV7 LDAA OLDROOM	
(0939)	10					
(094C)	DE	34			RMV9 LDX SAVX	RESTORE IX
(0944)	07					
(0949)	02					
(094E)	39				RTS	RETURN
					*	
					*	
					*	
(094F)	8D	08	F5		RANDROOM JSR RAND	GET ROOM
(0952)	84	1F			ANDA #\$1F	MAKE <= 32
(0954)	81	14			CMPA #20	IF > 20 THEN
(0956)	22	F7			BHI RANDROOM	DO IT AGAIN
(0958)	4D				TSTA	IF = 0 THEN
(0959)	27	F4			BEQ RANDROOM	DO IT AGAIN
(095B)	8D	00	00		JSR PNTROOM	POINT INDEX
(095E)	39				RTS	RETURN
					**SKIP	
					*	
					*	
(095F)	36				PNTROOM PSHA	SAVE A
(095C)	09	5F				
(093F)	09	5F				
(0960)	4A				DECA	A = 4(A-1) + 1
(0961)	48				ASLA	
(0962)	48				ASLA	
(0963)	4C				INCA	
(0964)	CE	00	40		LDX #ROOMS	POINT INDEX
(0967)	4A				PNT1 DECA	LOOP A = 1 TIMES
(0968)	27	00			BEQ PNT2	
(096A)	08				INX	
(096B)	20	FA			BRA PNT1	
(096D)	32				PNT2 PULA	RESTORE A
(0969)	03					
(096E)	39				RTS	RETURN
					*	


```

(096F) 36      *
(0970) 4A      *
(0971) 48      *
(0972) 4C      *
(0973) CE 00 90 PNTTRANS PSHA      SAVE A
(0976) 4A      DECA      A = 2(A-1) + 1
(0977) 27 00    LDX #TRANS POINT INDEX
(0979) 08      DECA      LOOP A - 1 TIMES
(097A) 20 FA    BEQ PNT4
(097C) 32      INX
(0978) 03      BRA PNT3
(097D) 39      PNT4      PULA      RESTORE A
RTS      RETURN

*
*
*
(097E) 8D 00 C1 PROMPTIN JSR CHARIN GET ANSW
(0981) 36      PSHA      PUSH IT
(0982) 81 0D    CMPA #CR   IF = CR THEN
(0984) 27 00    BEQ PROMPT9 GO TO END
(0986) 8D 00 C1 PHOMPT5 JSR CHARIN LOOP UNTIL CR
(0989) 81 0D    CMPA #CR
(0988) 26 F9    BNE PROMPT5
(098D) 32      PULA      RESTORE ANSWER
(0985) 07      RTS      RETURN
(098E) 39      **SKIP

*
*
*
(098F) 8D 08 F5 PROBLITY JSR RAND  GET RAND NUMBER
(0992) 84 7F    ANDA #$7F  MAKE <= 128
(0994) 81 64    CMPA #100  IF > 100 THEN
(0996) 22 F7    BHI PROBLITY DO IT AGAIN
(0998) A1 00    CMPA X     IF RAND <= PROB
(099A) 23 00    BLS PRB1   SET A
(099C) 4F      CLRA      ELSE CLEAR A
(099D) 20 00    BRA PRB5
(099F) 86 01    PRB1      LDAA #1
(0998) 03      PRB5      INX      INCREMENT IX
(09A1) 08      RTS      RETURN
(099E) 02
(09A2) 39

*
*
*
(09A3) 8D 09 5F CONECTED JSR PNTROOM ANSWER IS IN B
(09A6) E1 00    CMPB X     TEST 3 CONNECTIONS
(09A8) 27 00    REQ CONS
(09AA) E1 01    CMPB 1,X
(09AC) 27 00    BEQ CONS
(09AE) E1 02    CMPB 2,X
(09B0) 27 00    REQ CONS
(09B2) 5F      CLRB      B = 0 IF NOT CONNECTED
(09B3) 39      RTS
(09B4) C6 01    CON5      LDAB #1  ELSE B = 1
(09A9) 0A
(09AD) 06
(09B1) 02
(09B6) 39      RTS

*
*
*
(09B7) CE 02 70 WON      LDX #TX14
(09BA) 8D 00 C7 JSR STROUT
(09BD) 7C 00 2F INC END
(09C0) 39      RTS

*
*
*
(09C1) CE 02 4A LUST      LDX #TX12
(09C4) 8D 00 C7 JSR STROUT
(09C7) 7C 00 2F INC END
(09CA) 39      RTS

*
*
*
(09CB) 8E 0F FF MAIN     LDS #$0FFF SET STACK
(0101) 09 CB
(09CE) CE 05 23 MAN1     LDX #TX36 ASK FOR INSTRUCTIONS
(09D1) 8D 00 C7 JSR STROUT
(09D4) 8D 09 7E JSR PROMPTIN
(09D7) 81 59    CMPA #Y

```

(09D9)	27	00			BEQ	TEACH	SHOW THEM
(09DB)	81	4E			CMPA	#1N	
(09DD)	27	00			BEQ	STARTGAM	OR NOT
(09DF)	CE	05	62		LDX	#WHAT?	
(09E2)	BD	00	C7		JSR	STROUT	
(09E5)	20	E7			BRA	MAN1	
(09E7)	CE	05	FA		LOX	#TX99	
(09DA)	0C			TEACH			
(09EA)	BD	00	C7		JSR	STROUT	
(09ED)	BD	00	00		JSR	GENCAVES	INIT CAVES
(09EE)	0E			STARTGAM			
(09F0)	BD	00	00		JSR	PLAY	PLAY GAME
(09F3)	CE	04	FF		LDX	#TX35	ASK FOR MAP OF CAVE
(09F6)	BD	00	C7		JSR	STROUT	
(09F9)	BD	09	7E		JSR	PROMPTIN	
(09FC)	81	59		MAN2	CMPA	#1Y	
(09FE)	27	00			BEQ	DSPLAY	SHOW IT
(0A00)	81	4E			CMPA	#1N	
(0A02)	27	00			BEQ	NXTGAME	OR NOT
(0A04)	CE	05	62		LDX	#WHAT?	
(0A07)	BD	00	C7		JSR	STROUT	
(0A0A)	20	E7			BRA	MAN2	
(0A0C)	BD	00	00		JSR	DISPLAY	
(09FF)	0C			DSPLAY			
(0A0F)	CE	04	DF		NXTGAME	LDX	#TX34
(0A03)	08						ASK FOR ANOTHER GAME
(0A12)	BD	00	C7		JSR	STROUT	
(0A15)	BD	09	7E		JSR	PROMPTIN	
(0A18)	81	59			CMPA	#1Y	
(0A1A)	27	D1			BEQ	STARTGAM	PLAY IT
(0A1C)	81	4E			CMPA	#1N	
(0A1E)	27	00			BEQ	FINAL	OR NOT
(0A20)	CE	05	62		LDX	#WHAT?	
(0A23)	BD	00	C7		JSR	STROUT	
(0A26)	20	E7			BRA	NXTGAME	
(0A28)	CE	05	68		LDX	#TX37	
(0A1F)	08			FINAL			
(0A2B)	BD	00	C7		JSR	STROUT	
(0A2E)	CE	01	03		LDX	#CRLF	
(0A31)	BD	00	C7		JSR	STROUT	
(0A34)	7E	E0	E3		JMP	\$E0E3	
				**SKIP			
				*			
				*			
(0A37)	BD	00	00		GENCAVES	JSR	CLEAR
(09EE)	0A	37					CLEAR OLD ITEMS
(0A3A)	86	01			LDAA	#1	
(0A3C)	97	28			STAA	COUNT	SET UP 1 WUMPUS
(0A3E)	C6	57			LDAB	#1W	
(0A40)	D7	3C			STAB	SYMBOL	
(0A42)	BD	00	00		JSR	GENITEM	
(0A45)	C6	50			LDAR	#1P	SET UP 1 TO 2 PITS
(0A47)	D7	3C			STAB	SYMBOL	
(0A49)	BD	08	F5		JSR	RAND	
(0A4C)	84	01			ANDA	#1	
(0A4E)	4C				INCA		
(0A4F)	97	28			STAA	COUNT	
(0A51)	BD	00	00		JSR	GENITEM	
(0A54)	C6	42			LDAB	#1B	SET UP 1 TO 4 BAT COLONIES
(0A56)	D7	3C			STAB	SYMBOL	
(0A58)	BD	08	F5		JSR	RAND	
(0A5B)	84	03			ANDA	#3	
(0A5D)	4C				INCA		
(0A5E)	97	28			STAA	COUNT	
(0A60)	BD	00	00		JSR	GENITEM	
(0A63)	BD	09	4F		GEN1	JSR	RANDROOM
(0A66)	6D	03				TST	3,X
(0A68)	26	F9			BNE	GEN1	
(0A6A)	97	2C			STAA	CURRENT	
(0A6C)	CE	00	90		LDX	#TRANS	IF TRANSLATION TABLE
(0A6F)	6D	01			TST	1,X	IS NOT FILLED IN,
(0A71)	26	00			BNE	GEN6	
(0A73)	C6	14			LDAB	#20	
(0A75)	37			GEN2	PSHB		
(0A76)	BD	09	4F		JSR	RANDROOM	LOAD 20 ITEMS INTO
(0A79)	BD	09	6F		GEN3	JSR	PNTRANS
(0A7C)	6D	01				TST	1,X
(0A7E)	27	00			REQ	GEN5	TRANSLATION TABLE
(0A80)	88	07			ADDA	#7	
(0A82)	81	14			CMPA	#20	
(0A84)	23	F3			BLS	GEN3	
(0A86)	80	14			SUBA	#20	

(0A88)	20	EF			BRA GEN3	
(0A8A)	33			GEN5	PULB	
(0A7F)	0A					
(0A8B)	E7	01			STAB 1,X	
(0A8D)	5A				DECR	
(0A8E)	26	E5			BNE GEN2	
(0A90)	7F	00	2A	GEN6	CLR AWAKE	PUT WUMPUS TO SLEEP
(0A72)	1D					
(0A93)	BD	09	4F		JSR RANDROOM	
(0A96)	47				ASRA	GEN 10 TO 20 DAYS
(0A97)	8B	0A			ADDA #10	
(0A99)	97	2D			STAA DAYS	
(0A9B)	86	05			LDAA #5	SET UP 5 SHOTS
(0A9D)	97	36			STAA SHOTS	
(0A9F)	7F	00	31		CLR ROCKS	AND NO ROCKS
(0AA2)	7F	00	2F		CLR END	START NEW GAME
(0AA5)	39				RTS	RETURN
					**SKIP	
					*	
					*	
(0AA6)	CE	00	40	CLEAR	LDX #ROOMS	CLEAR ROOM LOOP
(0A38)	0A	A6				
(0AA9)	86	03		CLR1	LDAA #3	
(0AAB)	6D	00		CLR2	TST X	
(0AAD)	2A	00			RPL CLR3	
(0AAF)	63	00			COM X	CLEAR BLOCKED TUNNELS
(0AB1)	08			CLR3	INX	
(0AAE)	02					
(0AB2)	4A				DECA	
(0AB3)	26	F6			BNE CLR2	
(0AB5)	6F	00			CLR X	
(0AB7)	08				INX	
(0AB8)	8C	00	90		CPX #ROOMS+80	
(0ARB)	26	EC			BNE CLR1	
					*	
					*	
					*	
(0ARD)	01				NOP	REPLACE WITH RTS (39) TO PREVENT RESHUFFELING OF ROOM NUMBERS BETWEEN GAMES
					*	
					*	
					*	
(0ABE)	CE	00	90		LDX #TRANS	CLEAR TRANSLATION TABLE
(0AC1)	6F	01		CLR4	CLR 1,X	
(0AC3)	08				INX	
(0AC4)	08				INX	
(0AC5)	8C	00	B8		CPX #TRANS+40	
(0AC8)	26	F7			BNE CLR4	
(0ACA)	39				RTS	
					*	
					*	
					*	
(0ACB)	D6	2B		GENITEM	LDAB COUNT	LOOP FOR # OF ITEMS
(0A43)	0A	CB				
(0A52)	0A	CB				
(0A61)	0A	CB				
(0ACD)	37			GEN7	PSHB	
(0ACE)	BD	09	4F		JSR RANDROOM	
(0AD1)	6D	03			TST 3,X	FIND EMPTY ROOM
(0AD3)	26	F9			BNE GEN7+1	
(0AD5)	D6	3C			LDAB SYMBOL	LOAD WITH ITEM
(0AD7)	E7	03			STAB 3,X	
(0AD9)	C1	57			CMPB #W	IF ITEM IS WUMPUS THEN
(0ADB)	26	00			RNE GEN8	
(0ADD)	97	3F			STAA WUMPROOM	
(0ADF)	33			GEN8	PULB	ELSE DON'T
(0ADC)	02					
(0AE0)	5A				DECR	CYCLE THROUGH LOOP
(0AE1)	26	EA			BNE GEN7	
(0AE3)	39				RTS	
					**SKIP	
					*	
					*	
(0AE4)	7A	00	2D	PLAY	DEC DAYS	DECREASE DAYS
(09F1)	0A	E4				
(0AE7)	7D	00	2A		TST AWAKE	
(0AEA)	23	00			BLS GAME1	
(0AEC)	BD	00	00		JSR MOVE_W	MOVE WUMPUS
(0AEF)	BD	00	00	GAME1	JSR REPORT	REPORT
(0AEB)	03					
(0AF2)	7D	00	2F		TST END	IF END
(0AF5)	23	00			BLS GAME3	
(0AF7)	39				RTS	RETURN

```

(0AF8) CE 01 31 | GAME3 LDX #TX03 PROMPT FOR SHOOT OR MOVE
(0AF6) 01 |
(0AFB) BD 00 C7 | JSR STROUT
(0AFE) BD 09 7E | JSR PROMPTIN
(0B01) B1 53 | CMPA #1S
(0B03) 27 00 | BEQ GAME4
(0B05) B1 4D | CMPA #1M
(0B07) 27 00 | BEQ GAME5
(0B09) CE 05 62 | LDX #WHAT?
(0B0C) BD 00 C7 | JSR STROUT
(0B0F) 20 E7 | BRA GAME3
(0B11) BD 00 00 | GAME4 JSR SHOOT SHOOT
(0B04) 0C |
(0B14) 20 00 | BRA GAME6
(0B16) BD 00 00 | GAME5 JSR MOVE MOVE
(0B08) 0D |
(0B19) 7D 00 2F | GAME6 TST END
(0B15) 03 |
(0B1C) 23 00 | BLS GAME8
(0B1E) 39 | RTS
(0B1F) CE 01 03 | GAME8 LDX #CRLF SKIP A LINE
(0B1D) 01 |
(0B22) BD 00 C7 | JSR STROUT
(0B25) BD 00 00 | JSR HAPNINGS RANDOM ITEMS
(0B28) 20 BA | BRA PLAY NEXT LOOP
*
*
*
(0B2A) CE 00 BA | MOVE_W LDX #PROB3 ONE TIME IN FIVE,
(0AED) 0B 2A |
(0B2D) BD 09 8F | JSR PROBLITY DO NOT MOVE WUMPUS
(0B30) 4D | TSTA
(0B31) 26 00 | RNE MOVE1
(0B33) 96 3F | LDAA WUMPROOM MOVE TO RANDOM ROOM
(0B35) BD 09 5F | JSR PNTROOM
(0B38) C6 01 | LDAB #1
(0B3A) BD 09 1B | JSR RANDMOVE
(0B3D) 97 3F | STAA WUMPROOM
(0B3F) 6F 03 | CLR 3,X CLEAR CURRENT WUMPUS INDICATOR
(0B41) BD 09 5F | JSR PNTROOM
(0B44) C6 57 | LDAB #1W
(0B46) E7 03 | STAB 3,X SET NEW WUMPUS INDICATOR
(0B48) 39 | MOVE1 RTS
(0B32) 15 |
**SKIP
*
*
(0B49) 7D 00 2D | REPORT TST DAYS IF DAYS = 0 THEN
(0AF0) 0B 49 |
(0B4C) 2A 00 | BPL RPT0
(0B4E) CE 01 88 | LDX #TX08 STARVED TO DEATH
(0B51) BD 00 C7 | JSR STROUT
(0B54) BD 09 C1 | JSR LOST
(0B57) 39 | RTS
(0B58) 96 2C | RPT0 LDAA CURRENT
(0B4D) 0A |
(0B5A) BD 09 5F | JSR PNTROOM
(0B5D) E6 03 | LDAB 3,X
(0B5F) C1 42 | CMPB #1B STEPED INTO A
(0B61) 26 00 | BNE RPT1 BAT CAVE
(0B63) BD 00 00 | JSR BATS
(0B66) 20 E1 | BRA REPORT START AGAIN
(0B68) C1 57 | RPT1 CMPB #1W BUMPED INTO WUMPUS
(0B62) 05 |
(0B6A) 26 00 | RNE RPT2
(0B6C) BD 00 00 | JSR BUMP_W
(0B6F) 7D 00 2F | TST END IF ASLEEP
(0B72) 23 00 | BLS RPT2 CONTINUE
(0B74) 39 | RTS ELSE END
(0B75) C1 50 | RPT2 CMPB #1P STEPED INTO A PIT
(0B68) 09 |
(0B73) 01 |
(0B77) 26 00 | RNE RPT3
(0B79) BD 00 00 | JSR PITS
(0B7C) 39 | RTS
**SKIP
*
* REPORT CONTINUED
*
(0B7D) A6 00 | RPT3 LDAA X
(0B78) 04 |
(0B7F) BD 00 00 | JSR RPTROOM REPORT SURROUNDING ROOMS

```

(0B82)	A6	01			LDA	1,X	
(0B84)	BD	00	00		JSR	RPTRROOM	
(0B87)	A6	02			LDA	2,X	
(0B89)	BD	00	00		JSR	RPTRROOM	
(0B8C)	CE	01	07		LDX	#TX01	REPORT CURRENT ROOM
(0B8F)	BD	00	C7		JSR	STROUT	
(0B92)	96	2C			LDA	CURRENT	
(0B94)	BD	08	8F		JSR	ROOMOUT	
(0B97)	CE	01	1C		LDX	#TX02	REPORT CONNECTING TUNNELS
(0B9A)	BD	00	C7		JSR	STROUT	
(0B9D)	96	2C			LDA	CURRENT	
(0B9F)	BD	09	5F		JSR	PNTROOM	
(0BA2)	BD	08	F5		JSR	RAND	JUMBLE REPORTING
(0BA5)	84	07			ANDA	#S07	OF TUNNELS
(0BA7)	97	2B			STAA	COUNT	
(0BA9)	A6	02		HPT4	LDA	2,X	
(0BAB)	E6	01			LDA	1,X	
(0BAD)	E7	02			STAB	2,X	
(0BAF)	E6	00			LDA	X	
(0BB1)	E7	01			STAB	1,X	
(0BB3)	A7	00			STAA	X	
(0BB5)	7A	00	2B		DEC	COUNT	
(0BB8)	26	EF			RNE	RPT4	
(0BBA)	A6	00			LDA	X	REPORT CONNECTING
(0BBC)	BD	08	8F		JSR	ROOMOUT	ROOMS
(0BBF)	A6	01			LDA	1,X	
(0BC1)	BD	08	8F		JSR	ROOMOUT	
(0BC4)	A6	02			LDA	2,X	
(0BC6)	BD	08	8F		JSR	ROOMOUT	
(0BC9)	BD	0A	BD		JSR	DAYSLEFT	REPORT DAYS LEFT
(0BCC)	39				RTS		RETURN
					**SKIP		
					*		
					*		
(0BCD)	BD	08	02		RPTRROOM	JSR	PSHX
(0B80)	0B	CD					SAVE IX
(0B85)	0B	CD					
(0B8A)	0B	CD					
(0BD0)	4D				TSTA		
(0BD1)	2B	00			BMI	RRM9	
(0BD3)	BD	09	5F		JSR	PNTROOM	
(0BD6)	A6	03			LDA	3,X	
(0BD8)	81	50			CMPA	#1P	REPORT
(0BDA)	26	00			RNE	RRM1	
(0BDC)	CE	01	5F		LDX	#TX06	I FEEL A DRAFT
(0BDF)	BD	00	C7		JSR	STROUT	
(0BE2)	81	42		RRM1	CMPA	#1B	
(0BD8)	06						
(0BE4)	26	00			BNE	RRM2	
(0BE6)	CE	01	4E		LDX	#TX05	I HEAR WINGS
(0BE9)	BD	00	C7		JSR	STROUT	
(0BEC)	81	57		RRM2	CMPA	#1W	
(0BE5)	06						
(0BEE)	26	00			BNE	RRM9	
(0BF0)	CE	01	72		LDX	#TX07	I SMELL A WUMPUS
(0BF3)	BD	00	C7		JSR	STROUT	
(0BF6)	BD	08	13		RRM9	JSR	PULX
(0BD2)	23						RESTORE IX
(0BEF)	06						
(0BF9)	39				RTS		
					*		
					*		
					*		
(0BFA)	BD	08	02		HATS	JSR	PSHX
(0B64)	0B	FA					
(0BFD)	CE	03	46		LDX	#TX20	WHOOOPS
(0C00)	BD	00	C7		JSR	STROUT	
(0C03)	BD	09	4F		JSR	RANDROOM	PICK A ROOM
(0C06)	97	2C			STAA	CURRENT	MOVE TO IT
(0C08)	06	2D			LDA	DAYS	
(0C0A)	17				TBA		
(0C0B)	57				ASRB		
(0C0C)	57				ASRB		
(0C0D)	10				SBA		
(0C0E)	97	2D			STAA	DAYS	
(0C10)	BD	08	13		JSR	PULX	RESTORE IX
(0C13)	39				RTS		
					**SKIP		
					*		
					*		
(0C14)	CE	01	B9		PITS	LDX	#TX09
(0B7A)	0C	14					REPORT PIT

```

(0C17) BD 00 C7 | JSR STROUT
(0C1A) BD 09 C1 | JSR LOST
(0C1D) 39 | RTS

*
*
*
(0C1E) BD 08 02 | HUMP_W JSR PSHX
(0B6D) 0C 1E |
(0C21) 7D 00 2A | TST AWAKE IF NOT AWAKE
(0C24) 22 00 | BHI BMP5
(0C26) CE 01 03 | LDX #CRLF
(0C29) BD 00 C7 | JSR STROUT
(0C2C) CE 04 3B | LDX #TX28 WATCH IT
(0C2F) BD 00 C7 | JSR STROUT
(0C32) CE 04 BA | LDX #TX33 PRINT WARNING
(0C35) BD 00 C7 | JSR STROUT
(0C38) CE 01 03 | LDX #CRLF
(0C3B) BD 00 C7 | JSR STROUT
(0C3E) CE 04 45 | LDX #TX29 IS AWAKE
(0C41) BD 00 C7 | JSR STROUT
(0C44) 7C 00 2A | INC AWAKE WAKE HIM UP
(0C47) BD 08 13 | JSR PULX
(0C4A) 39 | RTS
(0C4B) CE 02 10 | HMP5 LDX #TX11 ELSE PRINT CHOMP
(0C25) 25 |
(0C4E) BD 00 C7 | JSR STROUT
(0C51) BD 09 C1 | JSR LOST
(0C54) BD 08 13 | JSR PULX
(0C57) 39 | RTS

**SKIP
*
*
(0C58) 7D 00 36 | SHOOT TST SHOTS IF NO SHOTS
(0B12) 0C 58 |
(0C5B) 26 00 | BNE S10 CALL THROW
(0C5D) BD 00 00 | JSR THROW
(0C60) 39 | RTS
(0C61) 7F 00 3E | S10 CLR WILD CLEAR INDICATORS
(0C5C) 04 |
(0C64) 7F 00 37 | CLR STOP
(0C67) 7A 00 36 | DEC SHOTS
(0C6A) CE 01 03 | LDX #CRLF CR, LF
(0C6D) BD 00 C7 | JSR STROUT
(0C70) CE 01 45 | LDX #TX04 WHERE TO?
(0C73) BD 00 C7 | JSR STROUT
(0C76) CE 01 03 | LDX #CRLF
(0C79) BD 00 C7 | JSR STROUT
(0C7C) CE 00 23 | LDX #ARRAY INIT ROOM ARRAY
(0C7F) DF 2B | STX ARRAYNO
(0C81) 96 2C | LDAA CURRENT
(0C83) 97 3D | STAA TEST
(0C85) C6 01 | LDAB #1
(0C87) D7 33 | STAB ROOMTLY
(0C89) BD 08 26 | S11 JSR ROOMIN LOAD UP TO 3 ROOMS
(0C8C) 4D | TSTA
(0C8D) 27 00 | BEQ S13 END ROOMS WHEN NO ROOM INPUT
(0C8F) A7 00 | STAA X
(0C91) 08 | INX
(0C92) 7C 00 33 | INC ROOMLY
(0C95) 96 2E | LDAA DELIM IF DELIMITER IS A CARRIAGE RETURN,
(0C97) 81 0D | CMPA #CR GO TO END OF ROOM LIST
(0C99) 27 00 | BEQ S13
(0C9B) D6 33 | LDAB ROOMTLY
(0C9D) C1 04 | CMPB #4
(0C9F) 26 E6 | BNE S11
(0CA1) BD 08 26 | S12 JSR ROOMIN IGNORE MORE ROOMS
(0CA4) 4D | TSTA
(0CA5) 27 00 | BEQ S13
(0CA7) 96 2E | LDAA DELIM IF DELIMITER IS A CARRIAGE RETURN,
(0CA9) 81 0D | CMPA #CR GO TO END OF ROOM LIST
(0CAB) 26 F4 | BNE S12
(0CAD) 7D 00 2A | S13 TST AWAKE IF WUMPUS IS ASLEEP THEN
(0C8E) 1E |
(0C9A) 12 |
(0CA6) 06 |
(0CB0) 22 00 | RHI S20
(0CB2) CE 01 03 | LDX #CRLF REPORT HIM AWAKE
(0CB5) BD 00 C7 | JSR STROUT
(0CB8) CE 04 3B | LDX #TX28
(0CBB) BD 00 C7 | JSR STROUT
(0CBE) CE 04 45 | LDX #TX29
(0CC1) BD 00 C7 | JSR STROUT

```

```

(0CC4) 7C 00 2A | INC AWAKE AND WAKE HIM UP
                | **SKIP
                | *
                | * SHOOT CONTINUED
                | *

(0CC7) 7A 00 33 | S20 DEC ROOMTLY LOOP FOR NUMBER OF ROOMS
(0CB1) 15
(0CCA) 26 00 | BNE S21
(0CCC) 39 | RTS
(0CCD) 7D 00 3E | S21 TST WILD IF SHOT IS ALREADY WILD THEN
(0CCB) 01
(0CD0) 22 00 | BHI S22 GO TO RANDOM SHOT
(0CD2) DE 28 | LDX ARRAYNO GET NEXT ROOM
(0CD4) 7C 00 29 | INC ARRAYNO+1 **NOTE: ARRAY MUST NOT CROSS PAGE BOUNDRY
(0CD7) E6 00 | LDAB X
(0CD9) 37 | PSMB
(0CDA) 96 3D | LDAA TEST IF NEXT ROOM IS CONNECTED TO CURRENT ROOM THEN
(0CDC) BD 09 A3 | JSR CONNECTED
(0CDF) 5D | TSTB
(0CE0) 22 00 | BHI S25 CONTINUE
(0CE2) CE 04 5C | LDX #TX30 ELSE PRINT WILD SHOT
(0CE5) BD 00 C7 | JSR STROUT FOR FIRST ROOM WILD
(0CE8) CE 04 38 | LDX #TX28 (WATCH IT)
(0CEB) BD 00 C7 | JSR STROUT
(0CEE) 7C 00 3E | INC WILD
(0CF1) 31 | INS IGNORE PUSHED ROOM
(0CF2) 96 3D | LDAA TEST MAKE RANDOM MOVE
(0CD1) 20
(0CF4) BD 09 1B | JSR RANDMOVE
(0CF7) 36 | PSHA
(0CF8) 32 | S25 PULA
(0CE1) 16
(0CF9) 97 3D | STAA TEST LOOK AT ROOM SHOT INTO
(0CFB) BD 09 5F | JSR PNTROOM
(0CFE) A6 03 | LDAA 3,X
(0D00) A1 57 | CMPA #1W
(0D02) 26 00 | BNE S31
(0D04) BD 09 87 | JSR WON IF SHOT WUMPUS THEN
(0D07) 7C 00 2F | INC END GAME WON
(0D0A) 39 | RTS
(0D0B) A1 42 | S31 CMPA #1B
(0D03) 07
(0D0D) 26 00 | BNE S32
(0D0F) BD 00 00 | JSR STBAT IF SHOT BATS
(0D12) 7D 00 37 | TST STOP THEN CALL STBAT
(0D15) 23 00 | RLS S32
(0D17) 39 | RTS
(0D18) A1 50 | S32 CMPA #1P
(0D0E) 09
(0D16) 01
(0D1A) 26 00 | BNE S33
(0D1C) BD 00 00 | JSR STPIT IF SHOT PIT
(0D1F) 7D 00 37 | TST STOP THEN CALL STPIT
(0D22) 23 00 | BLS S33
(0D24) 39 | RTS
(0D25) 96 3D | S33 LDAA TEST
(0D1B) 09
(0D23) 01
(0D27) 91 2C | CMPA CURRENT IF SHOT SELF
(0D29) 26 9C | BNE S20 THEN CALL STSELF
(0D2B) BD 00 00 | JSR STSELF
(0D2E) 39 | RTS
                | **SKIP
                | *
                | *
(0D2F) 7D 00 31 | THROW TST ROCKS
(0C5E) 0D 2F
(0D32) 26 00 | BNE THR1
(0D34) CE 05 8F | LDX #TX38 NOTHING TO THROW
(0D37) BD 00 C7 | JSR STROUT
(0D3A) 39 | RTS
(0D3B) 7A 00 31 | THR1 DEC ROCKS USE ROCK
(0D33) 07
(0D3E) CE 01 45 | THRO LDX #TX04 WHERE?
(0D41) BD 00 C7 | JSR STROUT
(0D44) BD 08 26 | JSR ROOMIN
(0D47) CE 01 03 | LDX #CRLF
(0D4A) BD 00 C7 | JSR STROUT
(0D4D) 4D | TSTA
(0D4E) 27 EE | BEQ THRO ENTER ONE ROOM ONLY
(0D50) D6 2C | LDAB CURRENT SEE IF CONNECTED ROOM
(0D52) BD 09 A3 | JSR CONNECTED

```

(0055)	5D				TSTR	
(0056)	22	00			RHI THR2	IF SO CONTINUE
(0058)	CE	03	9E		LDX #TX22	ELSE PRINT MISSED
(005B)	8D	00	C7		JSR STROUT	
(005E)	CE	05	8E		LDX #TX39	NOT CONNECTED
(0061)	8D	00	C7		JSR STROUT	
(0064)	39				RTS	
(0065)	8D	09	5F	THR2	JSR PNTR00M	
(0057)	0D					
(0068)	E6	03			LDAB 3,X	
(006A)	C1	57			CMPB #1W	IF HIT WUMPUS
(006C)	27	00			BEQ THR5	GO TO HIT WUMPUS (5)
(006E)	C1	42			CMPB #1B	IF HIT BATS
(0070)	26	00			BNE THR3	
(0072)	8D	00	00		JSR MIGRATN	CAUSE MIGRATION
(0075)	CE	03	9E	THR3	LDX #TX22	MISSED
(0071)	03					
(0078)	8D	00	C7		JSR STROUT	
(007B)	39				RTS	
(007C)	CE	00	C0	THR5	LDX #PROB8	HIT WUMPUS WITH A ROCK
(006D)	0E					
(007F)	8D	09	8F		JSR PROBLITY	
(0082)	4D				TSTA	
(0083)	23	00			BLS THR6	
(0085)	CE	02	61		LDX #TX13	BONK! YOU WON
(0088)	8D	00	C7		JSR STROUT	
(008B)	8D	09	87		JSR WON	
(008E)	CE	02	90		LDX #TX15	WITH A ROCK
(0091)	8D	00	C7		JSR STROUT	
(0094)	39				RTS	
(0095)	CE	03	81	THR6	LDX #TX21	THUD TRY AGAIN
(0084)	10					
(0098)	8D	00	C7		JSR STROUT	
(009B)	39				RTS	
					**SKIP*	
					*	
					*	
(009C)	CE	00	B8	STBAT	LDX #PROB1	
(0010)	0D	9C				
(009F)	8D	09	8F		JSR PROBLITY	IF PROBABLE TO
(00A2)	4D				TSTA	SHOOT BAT, DO IT
(00A3)	23	00			BLS STB9	
(00A5)	7C	00	37		INC STOP	
(00A8)	CE	04	6D		LDX #TX31	SHOT BAT
(00AB)	8D	00	C7		JSR STROUT	
(00AE)	39			STB9	RTS	
(00A4)	09					
					*	
					*	
					*	
(00AF)	CE	00	B9	STPIT	LDX #PROB2	
(001D)	0D	AF				
(00B2)	8D	09	8F		JSR PROBLITY	IF PROBABLE TO LOOSE ARROW
(00B5)	4D				TSTA	DO IT
(00B6)	23	00			BLS STP9	
(00B8)	7C	00	37		INC STOP	
(00BB)	CE	04	8A		LDX #TX32	LOST ARROW IN PIT
(00BE)	8D	00	C7		JSR STROUT	
(00C1)	39			STP9	RTS	
(00B7)	09					
					*	
					*	
					*	
(00C2)	CE	00	BA	STSELF	LDX #PROB3	
(002C)	0D	C2				
(00C5)	8D	09	8F		JSR PROBLITY	IF PROBABLE TO INJURE ONLY
(00C8)	4D				TSTA	DO IT
(00C9)	23	00			BLS STS7	
(00CB)	CE	03	00		LDX #TX19	SHOT LEG
(00CE)	8D	00	C7		JSR STROUT	
(00D1)	96	2D			LDAA DAYS	
(00D3)	81	05			CMPA #5	IF LESS THAN 5 DAYS LEFT
(00D5)	22	00			BHI STS3	
(00D7)	7C	00	2D		INC DAYS	REDUCE BY HALF
(00DA)	74	00	2D		LSR DAYS	
(00DD)	20	00			BRA STS5	
(00DF)	86	05		STS3	LDAA #5	ELSE REDUCE TO 5
(00D6)	08					
(00E1)	97	2D			STAA DAYS	
(00E3)	8D	08	8D	STS5	JSR DAYSLEFT	REPORT DAYS LEFT
(00DE)	04					
(00E6)	39				RTS	

(0DE7)	CE	01	E3	STS7	LDX #TX10	OTHERWISE SHOT SELF
(0DCA)	1C					
(0DEA)	BD	00	C7		JSR STROUT	
(0DED)	BD	09	C1		JSR LOST	
(0DF0)	39				RTS	
				**SKIP		
				*		
				*		
(0DF1)	CE	01	03	MOVE	LDX #CRLF	WRITE CR,LF
(0B17)	0D	F1				
(0DF4)	BD	00	C7		JSR STROUT	
(0DF7)	CE	01	45		LDX #TX04	WHERE TO
(0DFA)	BD	00	C7		JSR STROUT	
(0DFD)	BD	08	26		JSR ROOMIN	
(0E00)	CE	01	03		LDX #CRLF	
(0E03)	BD	00	C7		JSR STROUT	
(0E06)	4D				TSTA	
(0E07)	27	EA			BEQ MOVE	
(0E09)	D6	2C			LDAB CURRENT	IF NOT CONNECTED
(0E0B)	BD	09	A3		JSR CONNECTED	
(0E0E)	5D				TSTB	
(0E0F)	23	E0			BLS MOVE	TRY AGAIN
(0E11)	97	2C			STAA CURRENT	SET NEW CURRENT ROOM
(0E13)	39				RTS	
				*		
				*		
				*		
(0E14)	CE	05	DF	DISPLAY	LDX #TX40	PRINT HEADING
(0A0D)	0E	14				
(0E17)	BD	00	C7		JSR STROUT	
(0E1A)	86	01			LDAA #1	LOAD COUNTER
(0E1C)	CE	00	40		LDX #ROOMS	
(0E1F)	BD	08	02	DSP1	JSR PSHX	
(0E22)	CE	01	03		LDX #CRLF	AND GO TO NEW LINE
(0E25)	BD	00	C7		JSR STROUT	
(0E28)	BD	08	13		JSR PULX	
(0E2B)	36				PSHA	
(0E2C)	BD	08	8F		JSR ROOMOUT	PRINT ROOM
(0E2F)	BD	00	CD		JSR BLKOUT	AND BLANK
(0E32)	BD	00	CD		JSR BLKOUT	CHARACTERS
(0E35)	86	03			LDAA #3	
(0E37)	97	33			STAA ROOMTLY	
(0E39)	A6	00		DSP2	LDAA X	PRINT 3 CONNECTIONS
(0E3B)	BD	08	8F		JSR ROOMOUT	
(0E3E)	BD	00	CD		JSR BLKOUT	WITH BLANKS AS SEPERATORS
(0E41)	08				INX	
(0E42)	7A	00	33		DEC ROOMTLY	
(0E45)	26	F2			RNE DSP2	
(0E47)	BD	00	CD		JSR BLKOUT	AND BLANK
(0E4A)	BD	00	CD		JSR BLKOUT	
(0E4D)	A6	00			LDAA X	
(0E4F)	BD	00	C4		JSR CHAROUT	PRINT ROOM CONTENTS
(0E52)	08				INX	
(0E53)	32				PULA	
(0E54)	4C				INCA	LOOP THROUGH
(0E55)	81	15			CMPA #21	20 ROOMS
(0E57)	26	C6			BNE DSP1	
(0E59)	39				RTS	RETURN
				**SKIP		
				*		
				*		
(0E5A)	CE	00	BB	HAPNINGS	LDX #PROB4	POINT TO PROBABILITIES
(0B26)	0E	5A				
(0E5D)	BD	09	8F		JSR PROBLITY	
(0E60)	4D				TSTA	TEST FOR BAT MIGRATION
(0E61)	23	00			BLS HAP1	
(0E63)	BD	00	00		JSR MIGRATN	
(0E66)	BD	09	8F	HAP1	JSR PROBLITY	
(0E62)	03					
(0E69)	4D				TSTA	TEST FOR FIND A ROCK
(0E6A)	23	00			BLS HAP3	
(0E6C)	BD	00	00		JSR ROCKX	
(0E6F)	BD	09	8F	HAP3	JSR PROBLITY	
(0E6B)	03					
(0E72)	4D				TSTA	TEST FOR RATS EATING FOOD
(0E73)	23	00			BLS HAP5	
(0E75)	BD	00	00		JSR RATS	
(0E78)	BD	09	8F	HAP5	JSR PROBLITY	
(0E74)	03					
(0E7B)	4D				TSTA	TEST FOR ROCK SLIDE
(0E7C)	23	00			BLS HAP7	
(0E7E)	BD	00	00		JSR SLIDE	

(0E81)	BD	09	8F	HAP7	JSR	PROBLITY	
(0E7D)	03						
(0E84)	4D				TSTA		TEST FOR EXTRA SUPPLIES
(0E85)	23	00			BLS	HAP9	
(0E87)	BD	00	00		JSR	EXTRA	
(0E8A)	39			HAP9	RTS		RETURN
(0E86)	03						
				**SKIP			
				*			
				*			
(0E88)	BD	08	02	MIGRATN	JSR	PSHX	SAVE IX
(0E64)	0E	88					
(0D73)	0E	88					
(0E8E)	BD	08	F5		JSR	RAND	REDUCE DAYS BY
(0E91)	84	03			ANDA	#503	1 TO 4
(0E93)	4C				INCA		
(0E94)	16				TAB		
(0E95)	96	2D			LDAA	DAYS	
(0E97)	10				SBA		
(0E98)	97	2D			STAA	DAYS	
(0E9A)	CE	00	40		LDX	#ROOMS	
(0E9D)	A6	03		MIG1	LDAA	3,X	FIND SOME BATS
(0E9F)	81	42			CMPA	#18	
(0EA1)	27	00			BEQ	MIG2	
(0EA3)	08				INX		
(0EA4)	08				INX		
(0EA5)	08				INX		
(0EA6)	08				INX		
(0EA7)	20	F4			BRA	MIG1	
(0EA9)	BD	08	02	MIG2	JSR	PSHX	SAVE BAT LOCATION
(0EA2)	06						
(0EAC)	86	01			LDAA	#1	
(0EAE)	97	2B			STAA	COUNT	
(0EB0)	BD	0A	CB		JSR	GENITEM	LOAD NEW BATS RANDOMLY
(0ER3)	BD	0A	13		JSR	PULX	RESTORE OLD BAT LOCATION
(0EB6)	6F	03			CLR	3,X	CLEAR OUT OLD BATS
(0EB8)	CE	02	BC		LDX	#TX18	REPORT BATS
(0EBB)	BD	00	C7		JSR	STROUT	
(0EBE)	BD	08	13		JSR	PULX	RESTORE IX
(0EC1)	39				RTS		
				*			
				*			
				*			
(0EC2)	7D	00	36	ROCKX	TST	SHOTS	IF ARROWS LEFT
(0E6D)	0E	C2					
(0EC5)	27	00			BEQ	ROK1	
(0EC7)	39				RTS		RETURN
(0EC8)	BD	08	02	ROK1	JSR	PSHX	SAVE IX
(0EC6)	01						
(0ECB)	7C	00	31		INC	ROCKS	ADD TO ROCK PILE
(0ECE)	CE	03	A9		LDX	#TX23	REPORT FIND
(0ED1)	BD	00	C7		JSR	STROUT	
(0ED4)	CE	03	BE		LDX	#TX24	
(0ED7)	BD	00	C7		JSR	STROUT	
(0EDA)	BD	08	13		JSR	PULX	RESTORE IX
(0EDD)	39				RTS		
				**SKIP			
				*			
				*			
(0EDE)	BD	08	02	RATS	JSR	PSHX	SAVE IX
(0E76)	0E	DE					
(0EE1)	7C	00	2D		INC	DAYS	
(0EE4)	77	00	2D		ASR	DAYS	REDUCE DAYS BY HALF
(0EE7)	CE	03	F8		LDX	#TX26	REPORT RATS
(0EEA)	BD	00	C7		JSR	STROUT	
(0EED)	BD	08	13		JSR	PULX	RESTORE IX
(0EF0)	39				RTS		
				*			
				*			
				*			
(0EF1)	BD	08	02	SLIDE	JSR	PSHX	SAVE IX
(0E7F)	0E	F1					
(0EF4)	BD	09	4F	SLD1	JSR	RANDROOM	GET A TUNNEL
(0EF7)	97	30			STAA	OLDROOM	
(0EF9)	A6	01			LDAA	1,X	
(0EFB)	2B	F7			BMI	SLD1	IGNORE IF ALREADY CLOSED
(0EFD)	63	01			COM	1,X	CLOSE HALF OF TUNNEL
(0EFF)	BD	09	5F		JSR	PNTROOM	POINT TO OTHER HALF
(0F02)	96	30			LDAA	OLDROOM	
(0F04)	A1	00			CMPA	X	
(0F06)	27	00			BEQ	SLD5	FIND RIGHT TUNNEL BACK
(0F08)	0A				INX		

```

(0F09)  A1 00      |          CMPA X
(0F0B)  27 00      |          BEQ  SLDS
(0F0D)  08        |          INX
(0F0E)  63 00      |  SLD5    COM  X          CLOSE OTHER HALF
(0F07)  06        |
(0F0C)  01        |
(0F10)  CE 04 18   |          LDX  #TX27      REPORT SLIDE
(0F13)  BD 00 C7   |          JSR  STROUT
(0F16)  BD 08 13   |          JSR  PULX      RESTORE IX
(0F19)  39        |          RTS
          |
          |  **SKIP
          |  *
          |  *
(0F1A)  BD 08 02   |  EXTRA JSR  PSHX      SAVE IX
(0E88)  0F 1A      |
(0F1D)  BD 08 F5   |          JSR  RAND      INCREASE DAYS BY
(0F20)  84 03      |          ANDA  #S03      1 TO 4
(0F22)  4C        |          INCA
(0F23)  16        |          TAB
(0F24)  96 2D      |          LDAA DAYS
(0F26)  1B        |          ABA
(0F27)  97 2D      |          STAA DAYS
(0F29)  CE 03 A9   |          LDX  #TX23      REPORT FIND
(0F2C)  BD 00 C7   |          JSR  STROUT
(0F2F)  CE 03 CE   |          LDX  #TX25
(0F32)  BD 00 C7   |          JSR  STROUT
(0F35)  BD 08 13   |          JSR  PULX      RESTORE IX
(0F38)  39        |          RTS
          |
          |  *
          |  *
          |  *

```

SYMBOL TABLE FOLLOWS:

STAT	256	ARRY	35	ARRO	40	AWAE	42	BLAK	32
COUT	43	CR	13	CURT	44	DAYS	45	DELM	46
END	47	EOT	4	LF	10	OLDM	48	ROCS	49
R000	50	R00Y	51	SAVX	52	SHOS	54	STOP	55
STUF	56	SYML	60	TEST	61	WILD	62	WUMM	63
R005	64	TRAS	144	PR01	184	PR02	185	PR03	186
PR04	187	PR08	192	CHAN	193	CHAT	196	STRT	199
BLKT	205	MAIN	2507	CRLF	259	TX01	263	TX02	284
TX03	305	TX04	325	TX05	334	TX06	351	TX07	370
TX08	392	TX09	441	TX10	483	TX11	528	TX12	586
TX13	609	TX14	624	TX15	656	TX16	670	TX17	694
TX18	700	TX19	768	TX20	838	TX21	897	TX22	926
TX23	937	TX24	958	TX25	974	TX26	1016	TX27	1048
TX28	1083	TX29	1093	TX30	1116	TX31	1133	TX32	1162
TX33	1210	TX34	1247	TX35	1279	TX36	1315	WHA?	1378
TX37	1387	TX38	1423	TX39	1470	TX40	1503	TX99	1530
PSHX	2050	PULX	2067	R00N	2086	IN1	2096	IN2	2111
IN3	2149	IN5	2177	IN45	2173	IN31	2158	IN4	2171
R00T	2191	OUT0	2204	OUT5	2221	OUT1	2216	OUT7	2230
DECT	2261	DAYT	2237	DEC1	2264	DEC2	2286	RAND	2293
RANE	2331	RMV1	2339	RMV5	2357	RMV7	2378	PNTM	2399
RMV9	2380	RANM	2383	PNT1	2407	PNT2	2413	PNT5	2415
PNT3	2422	PNT4	2428	PRON	2430	PR09	2445	PRO5	2438
PROY	2447	PRR1	2463	PRB5	2465	COND	2467	CON5	2484
WON	2487	LOST	2497	MAN1	2510	TEAH	2535	STAM	2541
GENS	2615	PLAY	2788	MAN2	2547	DSPY	2572	NXTE	2575
DISY	3604	FINL	2600	CLER	2726	GENM	2763	GEN1	2659
GEN6	2704	GEN2	2677	GEN3	2681	GEN5	2698	CLR1	2729
CLR2	2731	CLR3	2737	CLR4	2753	GEN7	2765	GEN8	2783
GAM1	2799	MOVW	2858	REPT	2889	GAM3	2808	GAM4	2833
GAM5	2838	SHOT	3160	GAM6	2841	MOVE	3569	GAM8	2847
HAPS	3674	MOV1	2888	RPT0	2904	RPT1	2920	BATS	3066
RPT2	2933	BUMW	3102	RPT3	2941	PITS	3092	RPTM	3021
RPT4	2985	RRM9	3062	RRM1	3042	RRM2	3052	BMP5	3147
S10	3169	THRW	3375	S11	3207	S13	3245	S12	3233
S20	3271	S21	3277	S22	3314	S25	3320	S31	3339
S32	3352	STBT	3484	S33	3365	STPT	3503	STSF	3522
THR1	3387	THR0	3390	THR2	3429	THR5	3452	THR3	3445
MIGN	3723	THR6	3477	STB9	3502	STP9	3521	ST57	3559
STS3	3551	STS5	3555	DSP1	3615	DSP2	3641	HAP1	3686
HAP3	3695	ROCX	3778	HAP5	3704	RATS	3806	HAP7	3713
SLIE	3825	HAP9	3722	EXTA	3866	MIG1	3741	MIG2	3753
R0K1	3784	SLD1	3828	SLD5	3854				

END OF NORMAL EXECUTION

BASIC Source Listing

```
10 REM
20 REM  S U P E R W U M P U S
30 REM
40 REM
50 PRINT \ PRINT \ PRINT \ PRINT \ PRINT
60 INPUT "TO START THINGS OFF, ENTER A RANDOM NUMBER: ", X
70 IF X>0 AND X<10000 THEN 90
80 PRINT"FORGOT TO TELL YOU, IT MUST BE BETWEEN 1 AND 9999"\GOTO 60
90 X=RND(X/10000)
100 PRINT \ PRINT \ PRINT \ PRINT
110 DIM A1(5), R(20,3), C$(20), T(20,2), A$(72)
120 T=1
130 DATA 2,5,6,1,3,7,2,4,8,3,5,9,1,4,10,1,11,12,2,12,13,3,13,14
140 DATA 4,14,15,5,11,15,6,10,17,6,7,18,7,8,19,8,9,20,9,10,16
150 DATA 15,17,20,11,16,18,12,17,19,13,18,20,14,16,19
160 REM
170 REM  MAINLINE MODULE
180 REM
190 PRINT \ PRINT \ PRINT
200 PRINT "WELCOME TO THE WUMPUS CAVES."
210 PRINT"DO YOU WANT PLAYING INSTRUCTIONS?",
220 GOSUB 3680
230 IF X1 THEN 210
240 IF A$(1,1)="N" THEN 410
250 PRINT \ PRINT \ PRINT
260 PRINT"THIS CAVE HAS 20 INTERCONNECTED ROOMS."
270 PRINT"THE WUMPUS IS ASLEEP IN ONE AND MUST BE TAGGED FOR"
280 PRINT" YOU TO SUCCEED. ONLY WHEN HE IS AWAKE AND TAGGED"
290 PRINT" WILL HE LEAD YOU TO THE EXIT."
300 PRINT"IF HE FINDS YOU BEFORE HE IS TAGGED, HE WILL EAT YOU."
310 PRINT"IF YOU WAKE HIM UP HE MAY MOVE."
320 PRINT"LOOK OUT FOR BATS AND BOTTOMLESS PITS. WARNINGS FOR THEM"
330 PRINT" ARE FOR LOCATIONS ONE ROOM AWAY."
340 PRINT"YOU HAVE 5 IMMOBILIZING DARTS AVAILABLE."
350 PRINT"EACH SHOT MAY GO THROUGH 1 TO 5 CONNECTED ROOMS."
360 PRINT"YOU MAY MAKE ONE MOVE OR SHOT EACH HOUR."
370 PRINT"WHEN YOU ARE OUT OF DARTS, LOOK FOR ROCKS TO BONK HIM WITH."
380 PRINT" ROCKS CAN BE THROWN (SHOT) INTO ONE ROOM AND MAY"
390 PRINT" KNOCK HIM OUT."
400 PRINT\INPUT "HIT RETURN TO BEGIN", A$
410 GOSUB 580
420 GOSUB 1060
430 PRINT"WOULD YOU LIKE TO SEE A MAP OF THE CAVES?",
440 GOSUB 3680
450 IF X1 THEN 430
460 IF A$(1,1)="Y" THEN GOSUB 3280
470 PRINT"WOULD YOU LIKE TO PLAY ANOTHER GAME?",
480 GOSUB 3680
490 IF X1 THEN 470
500 IF A$(1,1)="Y" THEN 410
510 PRINT \ PRINT \ PRINT \ PRINT
520 PRINT"THANK YOU FOR PLAYING, COME AGAIN SOMETIME."
530 PRINT \ PRINT \ PRINT \ PRINT
540 END
550 REM
560 REM  INITIALIZE CAVES (GENCAVES)
570 REM
580 RESTORE
```

```

590 PRINT \ PRINT"HANG ON A BIT ",
600 FOR I=1 TO 20
610   FOR J=1 TO 3
620     READ R(I,J)
630   NEXT J
640   C$(I,I)=" " \ T(I,1)=I
650   IF T THEN T(I,2)=0 ELSE T(I,2)=I
660 NEXT I
670 REM   SETUP WUMPUS, PITS, BATS, & CURRENT ROOM
680 C1=1 \ X$="W"
690 GOSUB 970
700 W=R2
710 C1=FNA(2) \ X$="P"
720 GOSUB 970
730 C1=FNA(4) \ X$="B"
740 GOSUB 970
750 C=FNA(20)
760 IF C$(C,C)<>" " THEN 750
770 IF NOT T THEN 900
780 REM   LOAD TRANSLATION TABLE
790 PRINT"WHILE I SET THIS UP"
800 FOR I=1 TO 20
810   C1=FNA(20)
820   IF T(C1,2)=0 THEN 830 ELSE 850
830     T(C1,2)=I
840     GOTO 880
850     C1=C1+7
860     IF C1>20 THEN C1=C1-20
870     GOTO 820
880 NEXT I
890 REM   PUT WUMPUS TO SLEEP, GEN DAYS, SHOTS, ROCKS
900 A=0
910 D=10+INT(RND(0)*11)
920 S=5 \ R=0 \ E=0
930 RETURN
940 REM
950 REM   GEN ITEM IN ROOM (GENITEM)
960 REM
970 FOR I=1 TO C1
980   R2=FNA(20)
990   IF C$(R2,R2)<>" " THEN 980
1000  C$(R2,R2)=X$
1010 NEXT I
1020 RETURN
1030 REM
1040 REM   MAINLINE FOR A GAME (PLAY)
1050 REM
1060 D=D-1
1070 IF A THEN GOSUB 1230
1080 GOSUB 1330
1090 IF E THEN RETURN
1100 PRINT\INPUT "SHOOT OR MOVE?", A$
1110 IF LEN(A$)=0 THEN 1140
1120 IF A$(1,1)="S" THEN 1150
1130 IF A$(1,1)="M" THEN 1160
1140 PRINT"PLEASE ANSWER SHOOT OR MOVE" \ GOTO 1100
1150 PRINT\GOSUB 1990 \ GOTO 1170
1160 PRINT\GOSUB 2720
1170 IF E THEN RETURN
1180 PRINT\GOSUB 2800
1190 GOTO 1060

```

```

1200 REM
1210 REM  MOVE WUMPUS
1220 REM
1230 IF RND(0)<.2 THEN RETURN
1240 R0=W \ W2=1
1250 GOSUB 3480
1260 C$(W,W)=" "
1270 W=R0
1280 C$(W,W)="W"
1290 RETURN
1300 REM
1310 REM  REPORT STATUS
1320 REM
1330 IF D>0 THEN 1360
1340 PRINT"YOU HAVE RUN OUT OF SUPPLIES AND WILL STARVE."
1350 GOSUB 3630 \ RETURN
1360 IF C$(C,C)<>"B" THEN 1420
1370 PRINT"WHOOOPS, BATS RELOCATE YOU."
1380 PRINT" YOU LOSE SOME SUPPLIES."
1390 C=FNA(20)
1400 D=D-INT(D/4)
1410 GOTO 1330
1420 IF C$(C,C)<>"W" THEN 1450
1430 GOSUB 1700
1440 IF E THEN RETURN
1450 IF C$(C,C)<>"P" THEN 1480
1460 PRINT"YYYIIIIIIEEEEEE... YOU FELL INTO A PIT!!"
1470 GOSUB 3630 \ RETURN
1480 PRINT \ PRINT"---START OF NEXT HOUR---"\PRINT
1490 FOR I=1 TO 3
1500 C1=R(C,I)
1510 IF C1=0 THEN 1550
1520 IF C$(C1,C1)="P" THEN PRINT"<<< I FEEL A DRAFT >>>"
1530 IF C$(C1,C1)="B" THEN PRINT"<<< I HEAR WINGS >>>"
1540 IF C$(C1,C1)="W" THEN PRINT"<<< I SMELL A WUMPUS!!! >>>"
1550 NEXT I
1560 PRINT
1570 FOR I=1 TO FNA(6)
1580 R0=R(C,1)
1590 R(C,1)=R(C,2)
1600 R(C,2)=R(C,3)
1610 R(C,3)=R0
1620 NEXT I
1630 PRINT"CURRENT ROOM IS", T(C,2)
1640 PRINT"TUNNELS LEAD TO", T(R(C,1),2), T(R(C,2),2), T(R(C,3),2)
1650 PRINT"YOU HAVE ENOUGH SUPPLIES FOR", D, " MORE HOURS"
1660 RETURN
1670 REM
1680 REM  BUMP INTO WUMPUS
1690 REM
1700 IF A THEN 1790
1710 PRINT"LOOK OUT, YOU STEPPED ON HIS ",
1720 ON FNA(4) GOTO 1730,1740,1750,1760
1730 PRINT"FLIPPER", \ GOTO 1770
1740 PRINT"TRUNK", \ GOTO 1770
1750 PRINT"WING", \ GOTO 1770
1760 PRINT"CLAW",
1770 PRINT"!! NOW HE IS AWAKE."
1780 A=1 \ RETURN
1790 DATA "C","H","O","M","P"
1800 RESTORE 1790

```



```

1810 FOR I=1 TO 5
1820   FOR J=1 TO 400
1830   NEXT J
1840   READ A$
1850   PRINT"  ",A$,
1860   NEXT I
1870   FOR I=1 TO 500 \ NEXT I
1880   PRINT"    M U N C H",
1890   FOR I=1 TO 300 \ NEXT I
1900   PRINT"    MUNCH    MUNCH  ",
1910   FOR I=1 TO 450 \ NEXT I
1920   PRINT"G U L P"
1930   FOR I=1 TO 500 \ NEXT I
1940   PRINT"  THE WUMPUS GOTCHA"
1950   GOSUB 3630 \ RETURN
1960   REM
1970   REM    SHOOT
1980   REM
1990   IF S>0 THEN 2010
2000   GOSUB 2520 \ RETURN
2010   W1=0 \ S0=0 \ S=S-1
2020   INPUT "HOW MANY ROOMS DO YOU WISH TO SHOOT THRU? ",R2
2030   IF R2>0 AND R2<6 THEN 2050
2040   PRINT "NUMBER MUST BE FROM 1 TO 5"\GOTO 2020
2050   FOR I=1 TO R2
2060     IF I=1 THEN INPUT "ENTER THE FIRST ROOM NUMBER: ",A1(I)
2070     IF I>1 THEN INPUT "ENTER THE NEXT ROOM NUMBER: ",A1(I)
2080     A1(I)=FNB(A1(I))
2090     FOR J=1 TO I-1
2100       IF A1(I)<>A1(J) THEN 2120
2110       PRINT "SORRY, CAN'T SHOOT INTO SAME ROOM TWICE."\EXIT 2060
2120     NEXT J
2130   NEXT I
2140   PRINT\IF A THEN 2170
2150   PRINT"WATCH IT, THE WUMPUS IS AWAKE!"
2160   A=1
2170   R3=C
2180   FOR I=1 TO R2
2190     IF W1 THEN 2230
2200     IF FNC(R3,A1(I)) THEN 2280
2210     PRINT"WATCH IT, WILD SHOT!"
2220     W1=1
2230     R0=R3
2240     W2=0
2250     I1 = I
2260     GOSUB 3480
2270     I = I1
2280     IF W1 THEN R3=R0 ELSE R3=A1(I)
2290     IF C$(R3,R3)<>"W" THEN 2320
2300     GOSUB 3600
2310     E=1 \ RETURN
2320     IF C$(R3,R3)<>"B" THEN 2350
2330     IF RND(0)>.33 THEN 2350
2340     PRINT"BIG DEAL, YOU SHOT A BAT" \ RETURN
2350     IF C$(R3,R3)<>"P" THEN 2380
2360     IF RND(0)>.33 THEN 2380
2370     PRINT"DART WAS SUCKED INTO A PIT" \ RETURN
2380     IF R3<>C THEN 2470
2390     PRINT"NICE GOING,TURKEY, YOU SHOT YOURSELF ",
2400     IF RND(0)>.5 THEN 2450
2410     PRINT"IN THE LEG"

```

```

2420 PRINT" AND HAVE USED MEDICAL SUPPLIES."
2430 IF D>5 THEN D=5 ELSE D=INT(D/2)
2440 RETURN
2450 PRINT"AND WILL NEVER MAKE IT"
2460 GOSUB 3630 \ RETURN
2470 NEXT I
2480 RETURN
2490 REM
2500 REM THROW A ROCK
2510 REM
2520 IF R>0 THEN 2550
2530 PRINT"SHOOT WHAT? YOU HAVE NO ARROWS OR ROCKS."
2540 RETURN
2550 INPUT "WHERE DO YOU WISH TO THROW IT? ",R0
2560 R0=FNB(R0)
2570 IF FNC(C,R0) THEN 2590
2580 PRINT"YOU CAN'T GET THERE FROM HERE" \ RETURN
2590 IF C$(R0,R0)<>"W" THEN 2650
2600 IF RND(0)>.5 THEN 2630
2610 PRINT"B O N K !!, YOU DAZZED HIM WITH A ROCK"
2620 GOSUB 3600 \ RETURN
2630 PRINT"T H U D. THAT JUST MAKE HIM MAD, LOOK OUT"
2640 RETURN
2650 PRINT"MISSED"
2660 IF C$(R0,R0)<>"B" THEN RETURN
2670 PRINT"YOU HIT A BAT CAVE, HOWEVER"
2680 GOSUB 2870 \ RETURN
2690 REM
2700 REM MOVE
2710 REM
2720 INPUT "WHERE TO? ", R0
2730 R0=FNB(R0)
2740 IF FNC(C,R0) THEN 2760
2750 PRINT"CAN'T GET THERE FROM HERE" \ GOTO 2720
2760 C=R0 \ RETURN
2770 REM
2780 REM RANDOM HAPPENINGS
2790 REM
2800 IF RND(0)>.9 THEN GOSUB 2870
2810 IF RND(0)>.75 THEN GOSUB 2990
2820 IF RND(0)>.95 THEN GOSUB 3040
2830 IF RND(0)>.9 THEN GOSUB 3080
2840 IF RND(0)>.8 THEN GOSUB 3210
2850 RETURN
2860 REM MIGRATION
2870 D=D-FNA(3)
2880 IF D<2 THEN D=2
2890 FOR I=1 TO 20
2900 IF C$(I,I)="B" THEN EXIT 2920
2910 NEXT I
2920 R0=I \ C1=1 \ X$="B"
2930 GOSUB 970
2940 C$(R0,R0)=" "
2950 PRINT"DUCK!! BAT MIGRATION, ONE COLONY OF BATS HAS MOVED"
2960 PRINT" YOU LOSE SOME SUPPLIES WHILE HIDING"
2970 RETURN
2980 REM ROCKS
2990 IF S>0 THEN RETURN
3000 PRINT"LOOK, YOU FOUND A THROWING ROCK!!"
3010 R=R+1
3020 RETURN

```

```

3030 REM    RATS
3040 D=INT(D/2)
3050 PRINT"RATS FROM THE PITS EAT HALF YOUR SUPPLIES!!"
3060 RETURN
3070 REM    ROCKSLIDE
3080 R0=FNA(20)
3090 FOR I=1 TO 3
3100 IF R(R0,I)>0 THEN EXIT 3130
3110 NEXT I
3120 GOTO 3080
3130 R1=R(R0,I)
3140 R(R0,I)=0
3150 FOR I=1 TO 3
3160 IF R(R1,I)=R0 THEN R(R1,I)=0
3170 NEXT I
3180 PRINT"LISTEN!! A ROCK SLIDE HAS CLOSED A TUNNEL"
3190 RETURN
3200 REM    EXTRA SUPPLIDES
3210 D=D+FNA(5)
3220 PRINT"LOOK,YOU FOUND SUPPLIES LEFT BY A"
3230 PRINT" PREVIOUSLY (EATEN) EXPLORER"
3240 RETURN
3250 REM
3260 REM    MAP
3270 REM
3280 PRINT
3290 PRINT" ROOM      TUNNELS      ITEM      ROOM      TUNNELS      ITEM"
3300 PRINT
3310 FOR I=1 TO 10
3320 FOR J=1 TO 20
3330 IF T(J,2)=1 THEN EXIT 3350
3340 NEXT J
3350 PRINT%4I, T(J,2), " ", T(R(J,1),2), T(R(J,2),2), T(R(J,3),2),
3360 PRINT"      ", C$(J,J),
3370 PRINT"      ",
3380 FOR J=1 TO 20
3390 IF T(J,2)=I+10 THEN EXIT 3410
3400 NEXT J
3410 PRINT%4I, T(J,2), " ", T(R(J,1),2), T(R(J,2),2), T(R(J,3),2),
3420 PRINT"      ", C$(J,J)
3430 NEXT I
3440 RETURN
3450 REM
3460 REM    RANDMOVE
3470 REM
3480 FOR I=1 TO 50
3490 IF I=49 THEN EXIT 3560
3500 J=FNA(3)
3510 IF R(R0,J)<1 THEN 3540
3520 IF C$(R(R0,J),R(R0,J))=" " THEN EXIT 3550
3530 IF NOT W2 THEN EXIT 3550
3540 NEXT I
3550 R0=R(R0,J)
3560 RETURN
3570 REM
3580 REM    WON & LOST
3590 REM
3600 PRINT"GOOD FOR YOU, YOU GOT HIM AND HE"
3610 PRINT" WILL LEAD YOU OUT OF THE CAVE"
3620 E=1 \ RETURN
3630 PRINT"YOU LOSE (HEE HEE)"

```

```

3640 E=1 \ RETURN
3650 REM
3660 REM   CHECK INPUT (YES OR NO)
3670 REM
3680 INPUT " ",A$
3690 X1=0
3700 IF LEN(A$)=0 THEN 3730
3710 IF A$(1,1)="Y" THEN RETURN
3720 IF A$(1,1)="N" THEN RETURN
3730 X1=1 \ !"PLEASE ANSWER YES OR NO" \ RETURN
3740 REM
3750 REM   FUNCTIONS
3760 REM
3770 REM   RETURN A RANDOM #, 1 THROUGH X
3780 DEF FNA(B)=INT(RND(0)*B)+1
3790 REM   INPUT A VALID ROOM #
3800 DEF FNB(X)
3810   FOR I1=1 TO 20
3820     IF T(I1,2)=X THEN RETURN T(I1,1)
3830   NEXT I1
3840   INPUT "MUST BE A ROOM NUMBER FROM 1 TO 20, TRY AGAIN: ", X
3850   GOTO 3810
3860 FNEND
3870 REM   CHECK CONNECTION OF X AND Y
3880 DEF FNC(X,Y)
3890   IF R(X,1)=Y OR R(X,2)=Y OR R(X,3)=Y THEN RETURN 1
3900   RETURN 0
3910 FNEND

```


Appendix C:

PAPERBYTE™ Bar Code Representation of Executable Code

6800 Assembler Bar Codes

BASIC Bar Codes

Beginning on page 65 is a complete machine readable representation (PAPERBYTE™ bar codes) of the object code for Jack Emmerichs' SUPER WUMPUS 6800 assembly language program, as assembled in the listing found on pages 25 to 48 of this book.

This representation uses the absolute loader format, in which each bar code frame (one line of bars running from top to bottom of the page) contains a two byte address followed by data which is loaded in ascending order starting at that address.

The object code listing shown below gives the information in hexadecimal form.

For details on the frame format and absolute loader format used in this and all PAPERBYTE™ books, see the PAPERBYTE publication *Bar Code Loader* by Ken Budnick. This book contains a brief history on bar codes, a general bar code loader algorithm with flow charts and complete program listings for 6800, 6502, and 8080 or Z-80 based systems.

```

0000 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0010 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0020 7E 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 7F
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0040 02 05 06 00 01 03 07 00 02 04 08 00 03 05 09 00 37
0050 01 04 0A 00 01 0B 0C 00 02 0C 0D 00 03 0D 0E 00 60
0060 04 0E 0F 00 05 0B 0F 00 06 0A 11 00 06 07 12 00 80
0070 07 08 13 00 08 09 14 00 09 0A 10 00 0F 11 14 00 9E
0080 0B 10 12 00 0C 11 13 00 0D 12 14 00 0E 10 13 00 C1
0090 01 01 02 02 03 03 04 04 05 05 06 06 07 07 08 08 48
00A0 09 09 0A 0A 0B 0B 0C 0C 0D 0D 0E 0E 0F 0F 10 10 C8
00B0 11 11 12 12 13 13 14 14 21 21 14 05 0A 05 05 08 0B
00C0 21 7E E1 AC 7E E1 D1 36 BD E0 7E 32 39 36 BD E0 EB
00D0 CC 32 39 00 00 00 00 00 00 00 00 00 00 00 00 00 37
00E0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00F0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100 7E 09 CB 0D 0A 00 04 0D 0A 0A 00 43 55 52 52 45 0F
0110 4E 54 20 52 4F 4F 4D 20 49 53 3A 04 0D 0A 00 00 10
0120 54 55 4E 4E 45 4C 53 20 4C 45 41 44 20 54 4F 3A 5C
0130 04 0D 0A 0A 00 4D 4F 56 45 20 4F 52 20 53 48 4F 27
0140 4F 54 3F 20 04 20 57 48 45 52 45 3F 20 04 0D 0A 1B
0150 00 00 49 20 48 45 41 52 20 57 49 4E 47 53 04 0D 42
0160 0A 00 00 49 20 46 45 45 4C 20 41 20 44 52 41 46 2D
0170 54 04 0D 0A 00 00 49 20 53 4D 45 4C 4C 20 41 20 D6
0180 57 55 4D 50 55 53 21 04 0D 0A 00 00 59 4F 55 20 4A
0190 48 41 56 45 20 52 55 4E 20 4F 55 54 20 4F 46 20 26
01A0 53 55 50 50 4C 49 45 53 20 41 4E 44 20 57 49 4C 74
01B0 4C 20 53 54 41 52 56 45 04 0D 0A 00 00 59 59 59 67
01C0 49 49 49 49 45 45 45 45 45 45 2E 2E 2E 2E 20 59 F3
01D0 4F 55 20 46 45 4C 4C 20 49 4E 54 4F 20 41 20 50 12
01E0 49 54 04 0D 0A 00 00 41 41 52 52 52 52 47 47 47 57
01F0 47 48 48 48 2E 2E 2E 2E 20 59 4F 55 20 48 41 56 F3
0200 45 20 53 48 4F 54 20 59 4F 55 52 53 45 4C 46 04 40
0210 0D 0A 00 00 43 20 48 20 4F 20 4D 20 50 20 20 43 91
0220 52 55 4D 50 20 4D 55 4E 43 48 20 47 55 4C 50 21 58
0230 0D 0A 00 00 20 20 54 48 45 20 57 55 4D 50 55 53 49
0240 20 47 4F 54 20 59 4F 55 21 04 0D 0A 00 00 59 4F 0B
0250 55 20 4C 4F 53 45 20 28 48 45 45 20 48 45 45 29 DD
0260 04 0D 0A 00 00 42 20 4F 20 4E 20 4B 20 21 20 04 0A
0270 0D 0A 00 00 47 4F 4F 44 20 46 4F 52 20 59 4F 55 64
0280 21 20 2D 20 59 4F 55 20 47 4F 54 20 48 49 4D 04 97
0290 20 57 49 54 48 20 41 20 52 4F 43 4B 21 04 0D 0A 48
02A0 00 00 53 55 50 50 4C 49 45 53 20 57 49 4C 4C 20 ED
02B0 4C 41 53 54 20 04 20 44 41 59 53 04 0D 0A 00 00 C4
02C0 42 41 54 20 4D 49 47 52 41 54 49 4F 4E 20 2D 20 0E
02D0 48 49 44 45 20 41 4E 44 20 57 41 49 54 0D 0A 00 79
02E0 00 20 20 4F 4E 45 20 43 4F 4C 4F 4E 59 20 4F 46 CB
02F0 20 42 41 54 53 20 48 41 53 20 4D 4F 56 45 44 04 E5
0300 0D 0A 00 00 4E 49 43 45 20 47 4F 49 4E 47 2C 20 16
0310 59 4F 55 20 53 48 4F 54 20 59 4F 55 52 53 45 4C AE

```


0320	46	0D	0A	00	00	20	20	41	4E	44	20	48	41	56	45	20	D4
0330	55	53	45	44	20	4D	45	44	49	43	41	4C	20	53	55	50	58
0340	50	4C	49	45	53	04	0D	0A	00	00	57	48	4F	4F	4F	50	74
0350	53	21	20	42	41	54	53	20	52	45	4C	4F	43	41	54	45	2D
0360	20	59	4F	55	0D	0A	00	00	20	20	59	4F	55	20	4C	4F	2C
0370	53	54	20	53	4F	4D	45	20	53	55	50	50	4C	49	45	53	90
0380	04	0D	0A	00	00	54	48	55	44	21	20	59	4F	55	20	4F	FD
0390	4E	4C	59	20	44	41	5A	45	44	20	48	49	4D	04	0D	0A	94
03A0	00	00	4D	49	53	53	45	44	04	0D	0A	00	00	4C	4F	4F	CA
03B0	4B	2C	20	59	4F	55	20	46	4F	55	4E	44	20	04	41	20	B5
03C0	54	48	52	4F	57	49	4E	47	20	52	4F	43	4B	04	53	55	6D
03D0	50	50	4C	49	45	53	0D	0A	00	00	20	20	46	52	4F	4D	58
03E0	20	41	4E	4F	54	48	45	52	20	28	45	41	54	45	4E	29	0F
03F0	20	48	55	4E	54	45	52	04	0D	0A	00	00	52	41	54	53	4B
0400	20	45	41	54	20	48	41	4C	46	20	59	4F	55	52	20	53	17
0410	55	50	50	4C	49	45	53	04	0D	0A	00	00	52	4F	43	4B	6C
0420	20	53	4C	49	44	45	21	20	41	20	54	55	4E	4E	45	4C	09
0430	20	49	53	20	43	4C	4F	53	45	44	04	57	41	54	43	48	11
0440	20	49	54	21	04	20	2D	20	54	48	45	20	57	55	4D	50	99
0450	55	53	20	49	53	20	41	57	41	4B	45	04	0D	0A	00	00	08
0460	57	49	4C	44	20	53	48	4F	54	20	2D	20	04	0D	0A	00	16
0470	00	42	49	47	20	44	45	41	4C	2C	20	59	4F	55	20	53	C4
0480	48	4F	54	20	41	20	42	41	54	04	0D	0A	00	00	41	20	BF
0490	44	4F	57	4E	44	52	41	46	54	20	48	41	53	20	53	55	6D
04A0	43	4B	45	44	20	54	48	45	20	41	52	52	4F	57	20	49	2C
04B0	4E	54	4F	20	41	20	50	49	54	04	0D	0A	00	00	59	4F	22
04C0	55	20	4A	55	53	54	20	53	54	45	50	50	45	44	20	4F	5F
04D0	4E	20	48	49	53	20	46	4C	49	50	50	45	52	21	04	0D	B6
04E0	0A	0A	00	44	4F	20	59	4F	55	20	57	41	4E	54	20	54	92
04F0	4F	20	50	4C	41	59	20	41	47	41	49	4E	3F	20	04	0D	95
0500	0A	00	00	44	4F	20	59	4F	55	20	57	41	4E	54	20	54	88
0510	4F	20	53	45	45	20	41	20	43	41	56	45	20	4D	41	50	EA
0520	3F	20	04	0D	0A	00	00	57	45	4C	43	4F	4D	45	20	54	FA
0530	4F	20	54	48	45	20	57	55	4D	50	55	53	20	43	41	56	5B
0540	45	53	2E	0D	0A	00	00	44	4F	20	59	4F	55	20	57	49	4D
0550	53	48	20	49	4E	53	54	52	55	43	54	49	4F	4E	53	3F	AF
0560	20	04	0A	20	57	48	41	54	3F	20	04	0D	0A	00	00	54	50
0570	48	41	4E	4B	20	59	4F	55	2C	20	43	4F	4D	45	20	41	10
0580	47	41	49	4E	20	53	4F	4D	45	54	49	4D	45	2E	04	0D	E1
0590	0A	00	00	53	48	4F	4F	54	20	57	48	41	54	3F	0D	0A	41
05A0	00	00	59	4F	55	20	48	41	56	45	20	4E	4F	20	41	52	B1
05B0	52	4F	57	53	20	4F	52	20	52	4F	43	4B	53	04	20	2D	FF
05C0	20	59	4F	55	20	43	41	4E	27	54	20	47	45	54	20	54	FE
05D0	48	45	52	45	20	46	52	4F	4D	20	48	45	52	45	04	0D	CD
05E0	0A	0A	00	52	4D	20	20	20	20	54	55	4E	4E	45	4C	53	5C
05F0	20	20	20	20	49	54	45	4D	0A	04	0D	0A	00	00	54	48	70
0600	49	53	20	43	41	56	45	20	48	41	53	20	32	30	20	49	C2
0610	4E	54	45	52	43	4F	4E	4E	45	43	54	45	44	20	52	4F	8D
0620	4F	4D	53	0D	0A	00	00	54	48	45	20	57	55	4D	50	55	A5
0630	53	20	49	53	20	41	53	4C	45	45	50	20	49	4E	20	4F	0F
0640	4E	45	20	41	4E	44	20	4D	55	53	54	20	42	45	20	4B	01
0650	49	4C	4C	45	44	0D	0A	00	00	49	46	20	48	45	20	28	05
0660	3F	29	20	46	49	4E	44	53	20	59	4F	55	20	48	45	20	E6
0670	57	49	4C	4C	20	45	41	54	20	59	4F	55	0D	0A	00	00	66
0680	49	46	20	59	4F	55	20	57	41	4B	45	20	48	49	4D	20	12
0690	55	50	20	48	45	20	4D	41	59	20	4D	4F	56	45	0D	0A	C7
06A0	00	00	4C	4F	4F	4B	20	4F	55	54	20	46	4F	52	20	42	B6
06B0	41	54	53	20	41	4E	44	20	50	49	54	53	0D	0A	00	00	52
06C0	57	41	52	4E	49	4E	47	53	20	41	52	45	20	46	4F	52	68
06D0	20	48	41	5A	41	52	44	53	20	31	20	52	4F	4F	4D	20	FB
06E0	41	57	41	59	0D	0A	00	00	59	4F	55	20	48	41	56	45	8A
06F0	20	35	20	41	52	52	4F	57	53	20	41	4E	44	20	41	20	C7
0700	4C	49	4D	49	54	45	44	20	53	54	4F	52	45	20	4F	46	6A
0710	20	53	55	50	50	4C	49	45	53	0D	0A	00	00	45	41	43	75
0720	48	20	53	48	4F	54	20	4D	41	59	20	47	4F	20	54	48	1F

0730	52	4F	55	47	48	20	31	20	54	4F	20	33	20	43	4F	4E	EC
0740	4E	45	43	54	45	44	20	52	4F	4F	4D	53	0D	0A	00	00	7A
0750	59	4F	55	20	4D	41	59	20	4D	41	4B	45	20	31	20	4D	00
0760	4F	56	45	20	4F	52	20	53	48	4F	54	20	45	41	43	48	3A
0770	20	44	41	59	0D	0A	00	00	57	48	45	4E	20	59	4F	55	64
0780	20	41	52	45	20	4F	55	54	20	4F	46	20	41	52	52	4F	19
0790	57	53	20	4C	4F	4F	4B	20	46	4F	52	20	52	4F	43	4B	55
07A0	53	0D	0A	00	00	20	20	57	48	49	43	48	20	43	41	4E	0F
07B0	20	42	45	20	54	48	52	4F	57	4E	20	49	4E	54	4F	20	23
07C0	4F	4E	4C	59	20	31	20	52	4F	4F	4D	0D	0A	00	00	20	27
07D0	20	41	4E	44	20	4D	41	59	20	4B	49	4C	4C	20	54	48	02
07E0	45	20	57	55	4D	50	55	53	0D	0A	0A	00	20	20	20	20	F7
07F0	20	20	20	20	20	47	4F	4F	44	20	4C	55	43	4B	0D	0A	2F
0800	0A	04	DF	34	30	09	09	AE	02	AF	00	9E	34	AF	02	35	7A
0810	EE	02	39	30	09	09	AE	04	AF	00	AE	02	AF	04	35	31	95
0820	31	31	31	EE	00	39	BD	08	02	C6	03	D7	2B	7F	00	32	FD
0830	BD	00	C1	81	20	26	08	D6	2B	C1	03	27	F3	20	26	81	F3
0840	0D	27	22	81	2C	27	1E	81	30	2D	36	81	39	22	32	7A	E4
0850	00	2B	27	2D	84	0F	36	96	32	16	48	48	48	1B	1B	33	67
0860	1B	97	32	20	CB	97	2E	96	32	27	12	CE	00	90	A1	01	95
0870	27	09	08	08	8C	00	B8	26	F5	20	06	A6	00	BD	08	13	43
0880	39	CE	01	03	BD	00	C7	CE	01	45	BD	00	C7	20	9A	4D	2E
0890	2A	0A	BD	00	CD	BD	00	CD	BD	00	CD	39	BD	08	02	BD	8F
08A0	00	CD	CE	00	90	4A	27	05	08	08	4A	26	FB	A6	01	81	44
08B0	09	22	03	BD	00	CD	BD	08	D5	BD	08	13	39	BD	08	02	2A
08C0	CE	02	9E	BD	00	C7	96	2D	BD	08	D5	CE	02	B6	BD	00	92
08D0	C7	BD	08	13	39	7F	00	2B	7C	00	2B	80	0A	2A	F9	8B	61
08E0	0A	7A	00	2B	36	96	2B	27	05	8A	30	BD	00	C4	32	8A	C9
08F0	30	BD	00	C4	39	37	96	39	0C	49	0C	49	9B	38	D6	39	7C
0900	0C	59	49	0C	59	49	0C	DB	39	99	38	0C	CB	19	8B	36	FE
0910	97	38	D7	39	33	39	00	00	00	00	00	97	30	86	32	97	61
0920	2B	DF	34	DE	34	7A	00	2B	BD	08	F5	81	55	23	06	08	B6
0930	81	AA	23	01	08	7D	00	2B	27	10	A6	00	2B	E5	BD	09	B2
0940	5F	6D	03	27	07	5D	26	DB	20	02	96	30	DE	34	39	BD	4B
0950	08	F5	84	1F	81	14	22	F7	4D	27	F4	BD	09	5F	39	36	4A
0960	4A	48	48	4C	CE	00	40	4A	27	03	08	20	FA	32	39	36	6B
0970	4A	48	4C	CE	00	90	4A	27	03	08	20	FA	32	39	BD	00	FA
0980	C1	36	81	0D	27	07	BD	00	C1	81	0D	26	F9	32	39	BD	06
0990	08	F5	84	7F	81	64	22	F7	A1	00	23	03	4F	20	02	86	BC
09A0	01	08	39	BD	09	5F	E1	00	27	0A	E1	01	27	06	E1	02	6B
09B0	27	02	5F	39	C6	01	39	CE	02	70	BD	00	C7	7C	00	2F	30
09C0	39	CE	02	4A	BD	00	C7	7C	00	2F	39	8E	0F	FF	CE	05	2A
09D0	23	BD	00	C7	BD	09	7E	81	59	27	0C	81	4E	27	0E	CE	CA
09E0	05	62	BD	00	C7	20	E7	CE	05	FA	BD	00	C7	BD	0A	37	41
09F0	BD	0A	E4	CE	04	FF	BD	00	C7	BD	09	7E	81	59	27	0C	51
0A00	81	4E	27	0B	CE	05	62	BD	00	C7	20	E7	BD	0E	14	CE	6E
0A10	04	DF	BD	00	C7	BD	09	7E	81	59	27	D1	81	4E	27	08	7B
0A20	CE	05	62	BD	00	C7	20	E7	CE	05	6B	BD	00	C7	CE	01	51
0A30	03	BD	00	C7	7E	E0	E3	BD	0A	A6	86	01	97	2B	C6	57	9B
0A40	D7	3C	BD	0A	CB	C6	50	D7	3C	BD	08	F5	84	01	4C	97	F0
0A50	2B	BD	0A	CB	C6	42	D7	3C	BD	08	F5	84	03	4C	97	2B	27
0A60	BD	0A	CB	BD	09	4F	6D	03	26	F9	97	2C	CE	00	90	6D	C4
0A70	01	26	1D	C6	14	37	BD	09	4F	BD	09	6F	6D	01	27	0A	3E
0A80	8B	07	81	14	23	F3	80	14	20	EF	33	E7	01	5A	26	E5	60
0A90	7F	00	2A	BD	09	4F	47	8B	0A	97	2D	86	05	97	36	7F	35
0AA0	00	31	7F	00	2F	39	CE	00	40	86	03	6D	00	2A	02	63	AB
0AB0	00	08	4A	26	F6	6F	00	08	8C	00	90	26	EC	01	CE	00	E2
0AC0	90	6F	01	08	08	8C	00	B8	26	F7	39	D6	2B	37	BD	09	A8
0AD0	4F	6D	03	26	F9	D6	3C	E7	03	C1	57	26	02	97	3F	33	23
0AE0	5A	26	EA	39	7A	00	2D	7D	00	2A	23	03	BD	0B	2A	BD	C6
0AF0	0B	49	7D	00	2F	23	01	39	CE	01	31	BD	00	C7	BD	09	A7
0B00	7E	81	53	27	0C	81	4D	27	0D	CE	05	62	BD	00	C7	20	60
0B10	E7	BD	0C	58	20	03	BD	0D	F1	7D	00	2F	23	01	39	CE	BD
0B20	01	03	BD	00	C7	BD	0E	5A	20	BA	CE	00	BA	BD	09	8F	64
0B30	4D	26	15	96	3F	BD	09	5F	C6	01	BD	09	1B	97	3F	6F	6F

0B40	03	BD	09	5F	C6	57	E7	03	39	7D	00	2D	2A	0A	CE	01	15
0B50	88	BD	00	C7	BD	09	C1	39	96	2C	BD	09	5F	E6	03	C1	5D
0B60	42	26	05	BD	0B	FA	20	E1	C1	57	26	09	BD	0C	1E	7D	DB
0B70	00	2F	23	01	39	C1	50	26	04	BD	0C	14	39	A6	00	BD	40
0B80	0B	CD	A6	01	BD	0B	CD	A6	02	BD	0B	CD	CE	01	07	BD	E4
0B90	00	C7	96	2C	BD	08	8F	CE	01	1C	BD	00	C7	96	2C	BD	CB
0BA0	09	5F	BD	08	F5	84	07	97	2B	A6	02	E6	01	E7	02	E6	CD
0BB0	00	E7	01	A7	00	7A	00	2B	26	EF	A6	00	BD	08	8F	A6	E9
0BC0	01	BD	08	8F	A6	02	BD	08	8F	BD	08	BD	39	BD	08	02	D3
0BD0	4D	2B	23	BD	09	5F	A6	03	81	50	26	06	CE	01	5F	BD	51
0BE0	00	C7	81	42	26	06	CE	01	4E	BD	00	C7	81	57	26	06	5B
0BF0	CE	01	72	BD	00	C7	BD	08	13	39	BD	08	02	CE	03	46	B4
0C00	BD	00	C7	BD	09	4F	97	2C	D6	2D	17	57	57	10	97	2D	F8
0C10	BD	08	13	39	CE	01	B9	BD	00	C7	BD	09	C1	39	BD	08	A2
0C20	02	7D	00	2A	22	25	CE	01	03	BD	00	C7	CE	04	3B	BD	10
0C30	00	C7	CE	04	BA	BD	00	C7	CE	01	03	BD	00	C7	CE	04	FF
0C40	45	BD	00	C7	7C	00	2A	BD	08	13	39	CE	02	10	BD	00	1D
0C50	C7	BD	09	C1	BD	08	13	39	7D	00	36	26	04	BD	0D	2F	35
0C60	39	7F	00	3E	7F	00	37	7A	00	36	CE	01	03	BD	00	C7	B2
0C70	CE	01	45	BD	00	C7	CE	01	03	BD	00	C7	CE	00	23	DF	BE
0C80	28	96	2C	97	3D	C6	01	D7	33	BD	08	26	4D	27	1E	A7	B3
0C90	00	08	7C	00	33	96	2E	81	0D	27	12	D6	33	C1	04	26	36
0CA0	E6	BD	08	26	4D	27	06	96	2E	81	0D	26	F4	7D	00	2A	5E
0CB0	22	15	CE	01	03	BD	00	C7	CE	04	3B	BD	00	C7	CE	04	F0
0CC0	45	BD	00	C7	7C	00	2A	7A	00	33	26	01	39	7D	00	3E	37
0CD0	22	20	DE	28	7C	00	29	E6	00	37	96	3D	BD	09	A3	5D	A3
0CE0	22	16	CE	04	5C	BD	00	C7	CE	04	3B	BD	00	C7	7C	00	F7
0CF0	3E	31	96	3D	BD	09	1B	36	32	97	3D	BD	09	5F	A6	03	2D
0D00	81	57	26	07	BD	09	B7	7C	00	2F	39	81	42	26	09	BD	15
0D10	0D	9C	7D	00	37	23	01	39	81	50	26	09	BD	0D	AF	7D	B0
0D20	00	37	23	01	39	96	3D	91	2C	26	9C	BD	0D	C2	39	7D	28
0D30	00	31	26	07	CE	05	8F	BD	00	C7	39	7A	00	31	CE	01	F7
0D40	45	BD	00	C7	BD	08	26	CE	01	03	BD	00	C7	4D	27	EE	6C
0D50	D6	2C	BD	09	A3	5D	22	0D	CE	03	9E	BD	00	C7	CE	05	BD
0D60	BE	BD	00	C7	39	BD	09	5F	E6	03	C1	57	27	0E	C1	42	D9
0D70	26	03	BD	0E	8B	CE	03	9E	BD	00	C7	39	CE	00	C0	BD	F6
0D80	09	8F	4D	23	10	CE	02	61	BD	00	C7	BD	09	B7	CE	02	1A
0D90	90	BD	00	C7	39	CE	03	81	BD	00	C7	39	CE	00	B8	BD	9F
0DA0	09	8F	4D	23	09	7C	00	37	CE	04	6D	BD	00	C7	39	CE	8E
0DB0	00	B9	BD	09	8F	4D	23	09	7C	00	37	CE	04	8A	BD	00	53
0DC0	C7	39	CE	00	BA	BD	09	8F	4D	23	1C	CE	03	00	BD	00	F7
0DD0	C7	96	2D	81	05	22	08	7C	00	2D	74	00	2D	20	04	86	2E
0DE0	05	97	2D	BD	08	BD	39	CE	01	E3	BD	00	C7	BD	09	C1	41
0DF0	39	CE	01	03	BD	00	C7	CE	01	45	BD	00	C7	BD	08	26	12
0E00	CE	01	03	BD	00	C7	4D	27	E8	D6	2C	BD	09	A3	5D	23	9D
0E10	E0	97	2C	39	CE	05	DF	BD	00	C7	86	01	CE	00	40	BD	64
0E20	08	02	CE	01	03	BD	00	C7	BD	08	13	36	BD	08	8F	BD	7F
0E30	00	CD	BD	00	CD	86	03	97	33	A6	00	BD	08	8F	BD	00	61
0E40	CD	08	7A	00	33	26	F2	BD	00	CD	BD	00	CD	A6	00	BD	11
0E50	00	C4	08	32	4C	81	15	26	C6	39	CE	00	BB	BD	09	8F	E3
0E60	4D	23	03	BD	0E	8B	BD	09	8F	4D	23	03	BD	0E	C2	BD	DB
0E70	09	8F	4D	23	03	BD	0E	DE	BD	09	8F	4D	23	03	BD	0E	47
0E80	F1	BD	09	8F	4D	23	03	BD	0F	1A	39	BD	08	02	BD	08	64
0E90	F5	84	03	4C	16	96	2D	10	97	2D	CE	00	40	A6	03	81	AD
0EA0	42	27	06	08	08	08	08	20	F4	BD	08	02	86	01	97	2B	B3
0EB0	BD	0A	CB	BD	08	13	6F	03	CE	02	BC	BD	00	C7	BD	D0	79
0EC0	13	39	7D	00	36	27	01	39	BD	08	02	7C	00	31	CE	03	A5
0ED0	A9	BD	00	C7	CE	03	BE	BD	00	C7	BD	08	13	39	BD	08	16
0EE0	02	7C	00	2D	77	00	2D	CE	03	F8	BD	00	C7	BD	08	13	74
0EF0	39	BD	08	02	BD	09	4F	97	30	A6	01	2B	F7	63	01	BD	C6
0F00	09	5F	96	30	A1	00	27	06	08	A1	00	27	01	08	63	00	38
0F10	CE	04	18	BD	00	C7	BD	08	13	39	BD	08	02	BD	08	F5	00
0F20	84	03	4C	16	96	2D	1B	97	2D	CE	03	A9	BD	00	C7	CE	57
0F30	03	CE	BD	00	C7	BD	08	13									2D

BASIC Bar Code

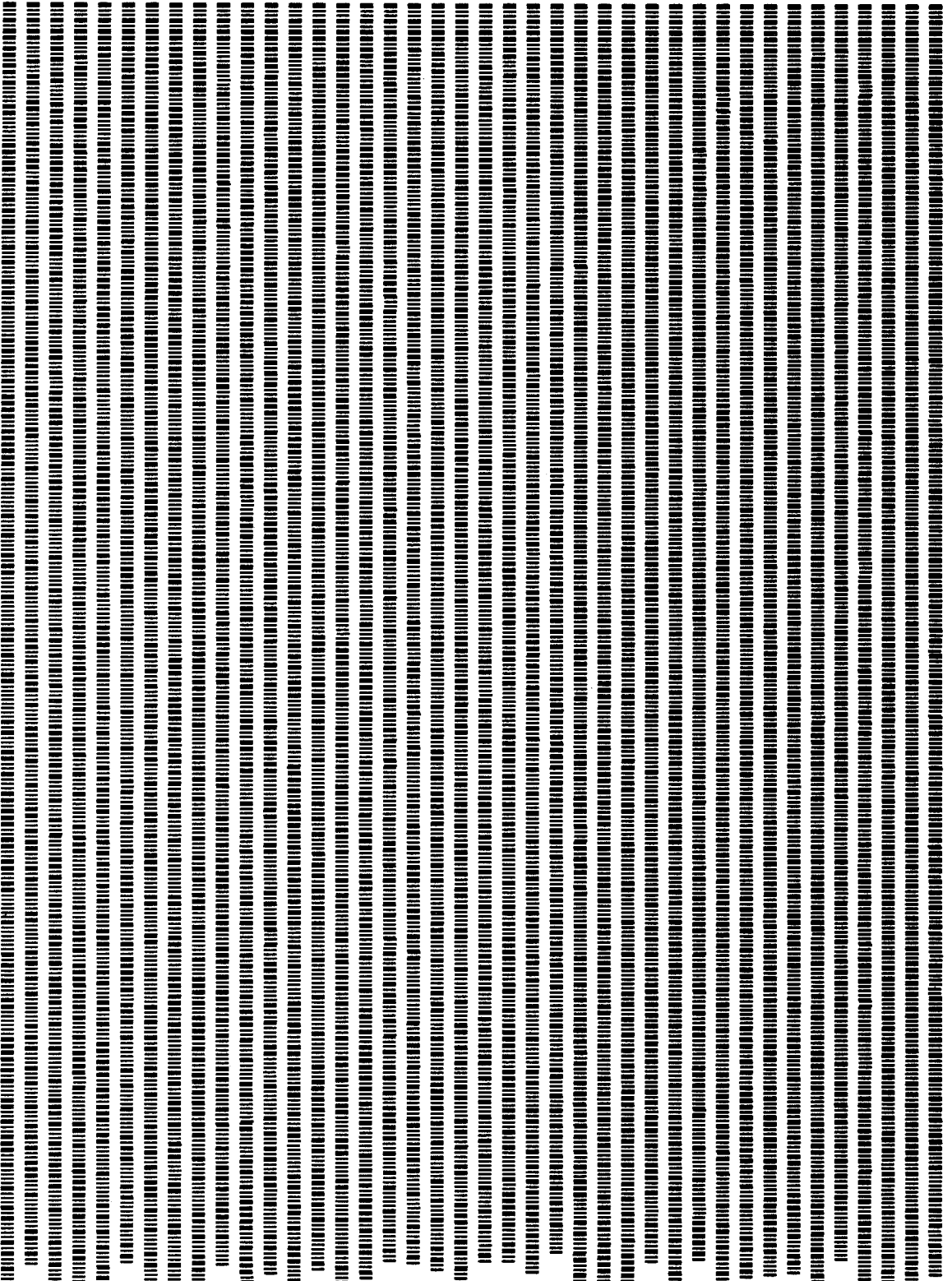
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9

1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100
 101
 102
 103
 104
 105
 106
 107
 108
 109
 110
 111
 112
 113
 114
 115
 116
 117
 118
 119
 120
 121
 122
 123
 124
 125
 126
 127
 128
 129
 130
 131
 132
 133
 134
 135
 136
 137
 138
 139
 140
 141
 142
 143
 144
 145
 146
 147
 148
 149
 150
 151
 152
 153
 154
 155
 156
 157
 158
 159
 160
 161
 162
 163
 164
 165
 166
 167
 168
 169
 170
 171
 172
 173
 174
 175
 176
 177
 178
 179
 180
 181
 182
 183
 184
 185
 186
 187
 188
 189
 190
 191
 192
 193
 194
 195
 196
 197
 198
 199
 200
 201
 202
 203
 204
 205
 206
 207
 208
 209
 210
 211
 212
 213
 214
 215
 216
 217
 218
 219
 220
 221
 222
 223
 224
 225
 226
 227
 228
 229
 230
 231
 232
 233
 234
 235
 236
 237
 238
 239
 240
 241
 242
 243
 244
 245
 246
 247
 248
 249
 250
 251
 252
 253
 254
 255
 256
 257
 258
 259
 260
 261
 262
 263
 264
 265
 266
 267
 268
 269
 270
 271
 272
 273
 274
 275
 276
 277
 278
 279
 280
 281
 282
 283
 284
 285
 286
 287
 288
 289
 290
 291
 292
 293
 294
 295
 296
 297
 298
 299
 300
 301
 302
 303
 304
 305
 306
 307
 308
 309
 310
 311
 312
 313
 314
 315
 316
 317
 318
 319
 320
 321
 322
 323
 324
 325
 326
 327
 328
 329
 330
 331
 332
 333
 334
 335
 336
 337
 338
 339
 340
 341
 342
 343
 344
 345
 346
 347
 348
 349
 350
 351
 352
 353
 354
 355
 356
 357
 358
 359
 360
 361
 362
 363
 364
 365
 366
 367
 368
 369
 370
 371
 372
 373
 374
 375
 376
 377
 378
 379
 380
 381
 382
 383
 384
 385
 386
 387
 388
 389
 390
 391
 392
 393
 394
 395
 396
 397
 398
 399
 400
 401
 402
 403
 404
 405
 406
 407
 408
 409
 410
 411
 412
 413
 414
 415
 416
 417
 418
 419
 420
 421
 422
 423
 424
 425
 426
 427
 428
 429
 430
 431
 432
 433
 434
 435
 436
 437
 438
 439
 440
 441
 442
 443
 444
 445
 446
 447
 448
 449
 450
 451
 452
 453
 454
 455
 456
 457
 458
 459
 460
 461
 462
 463
 464
 465
 466
 467
 468
 469
 470
 471
 472
 473
 474
 475
 476
 477
 478
 479
 480
 481
 482
 483
 484
 485
 486
 487
 488
 489
 490
 491
 492
 493
 494
 495
 496
 497
 498
 499
 500
 501
 502
 503
 504
 505
 506
 507
 508
 509
 510
 511
 512
 513
 514
 515
 516
 517
 518
 519
 520
 521
 522
 523
 524
 525

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4

[illegible]

2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9



2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

BYTE Publications Inc.
Production Credits

Blaise Liffick – Technical Editor
Edmond Kelly Jr. – Production Manager
Catherine LaHive – Production Assistant

Walter Banks, University of Waterloo, CCNG, Bar Codes
George Banta Company, Printing
Dawson Advertising, Cover Art

A Note About Bar Codes . . .

Bar codes are the newest form of machine readable data representation. They are used in all PAPERBYTETM software products in BYTE magazine articles and self contained book publications and combine efficiency of space, low cost, and ease of data entry with the need for mass produced machine readable representations of software. Bar codes were originally used for product identification in inventory control and supermarket checkout applications. Today, because of their direct binary representation of data, they are an ideal computer compatible communications medium. In the application of bar codes to software distribution (such as PAPERBYTE books and articles), the use of a simple but reliable optical scanning wand and an appropriate program provides a convenient means for the user to acquire software.

Our intent in making PAPERBYTE software available in bar code form is to provide a method of conveying machine readable information from documentation to the memories and mass storage of a user's system on a one time basis. We suggest that the user of software obtained in this manner should locally record the data on the mass storage devices of his system after the data has been scanned from the printed page. The PAPERBYTE bar code representations provide a standardized means of obtaining the data, but they cannot be compared to the convenience of local mass storage devices such as floppy disks, digital cassettes or audio cassettes. Thus if repeated use of the software obtained from bar code is anticipated, we recommend that the user make a copy on some form of magnetic medium.

Bar Code Loader by Ken Budnik, the first in the PAPERBYTE series of software books, provides a brief history of bar codes, a look at the PAPERBYTE bar code format including flowcharts, a general bar code loader algorithm and well documented programs with complete implementation and checkout procedures for 6800, 6502 and 8080/Z-80 based systems.

Bar Codes Provided by:

Walter Banks

Computer Communications Network Group

University of Waterloo

Waterloo, Ontario, Canada

SUPER- WUMPUS,

by Jack Emmerichs, is an exciting computer game incorporating the original structure of the WUMPUS game described in the book *What To Do After You Hit Return*, published by the People's Computer Company, along with added features which make the game even more fascinating. Programmed in both 6800 assembly language and BASIC, the game is not only addictively fun, but also provides a splendid tutorial on setting up unusual data structures (the tunnel and cave system of SUPER-WUMPUS forms a dodecahedron).

0-07-019342-8

